GE
Intelligent Platforms

Programmable Control Products

PACSystems* RX3i

Series 90-70 to RX3i I/O Adapter

Installation Guide, GFK-2793A

October 2012

Warnings, Cautions and Notes as Used in this Publication

Warning

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

Caution

Caution notices are used where equipment might be damaged if care is not taken.

Note: Notes merely call attention to information that is especially significant to understanding and operating the equipment.

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware or software, nor to provide for every possible contingency in connection with installation, operation, or maintenance. Features may be described herein which are not present in all hardware and software systems. GE Intelligent Platforms assumes no obligation of notice to holders of this document with respect to changes subsequently made.

GE Intelligent Platforms makes no representation or warranty, expressed, implied, or statutory with respect to, and assumes no responsibility for the accuracy, completeness, sufficiency, or usefulness of the information contained herein. No warranties of merchantability or fitness for purpose shall apply.

* indicates a trademark of GE Intelligent Platforms, Inc. and/or its affiliates. All other trademarks are the property of their respective owners.

©Copyright 2012 GE Intelligent Platforms, Inc.
All Rights Reserved

If you purchased this product through an Authorized Channel Partner, please contact the seller directly.

General Contact Information

Online technical support and GlobalCare	http://www.ge-ip.com/support
Additional information	http://www.ge-ip.com/
Solution Provider	solutionprovider.ip@ge.com

Technical Support

If you have technical problems that cannot be resolved with the information in this guide, please contact us by telephone or email, or on the web at www.ge-ip.com/support

Americas

Online Technical Support	www.ge-ip.com/support
Phone	1-800-433-2682
International Americas Direct Dial	1-780-420-2010 (if toll free 800 option is unavailable)
Technical Support Email	support.ip@ge.com
Customer Care Email	customercare.ip@ge.com
Primary language of support	English

Europe, the Middle East, and Africa

Online Technical Support	www.ge-ip.com/support
Phone	+800-1-433-2682
EMEA Direct Dial	+1-780-401-7717 (if toll free 800 option is unavailable or if dialing from a mobile telephone)
Technical Support Email	support.emea.ip@ge.com
Customer Care Email	customercare.emea.ip@ge.com
Primary languages of support	English, French, German, Italian, Czech, Spanish

Asia Pacific

Online Technical Support	www.ge-ip.com/support
Phone	+86-400-820-8208
	+86-21-3217-4826 (India, Indonesia, and Pakistan)
Technical Support Email	support.cn.ip@ge.com (China)
	support.jp.ip@ge.com (Japan)
	support.in.ip@ge.com (remaining Asia customers)
Customer Care Email	customercare.apo.ip@ge.com
	customercare.cn.ip@ge.com (China)

Contents

1. Introduction 9

1.1 Adapter Card Features 9

1.2 Additional Information 9

2. Installation & Setup 10

2.1 I/O Adapter Card Installation 10

2.2 Removing an I/O Adapter Card 10

2.3 Wiring Procedures 11

3. Supported Modules for Migration 13

3.1 RX3i I/O Replacements for Series 90-70 I/O 13

3.2 IC695CRH001 – 90-70 MDL252 to RX3i MDL241 Harness Assembly 14
- 3.2.1 Discrete Input Modules 14
- 3.2.2 Specification Comparison 16
- 3.2.3 Pin Mapping 17

3.3 IC695CRH002 – 90-70 MDL253 to RX3i MDL241 Harness Assembly 18
- 3.3.1 Discrete Input Modules 18
- 3.3.2 Specification Comparison 19
- 3.3.3 Pin Mapping 20

3.4 IC695CRH003 – 90-70 MDL250 to RX3i MDL260 Harness Assembly 21
- 3.4.1 Discrete Input Modules 21
- 3.4.2 Specification Comparison 22
- 3.4.3 Pin Mapping 23

3.5 IC695CRH004 – 90-70 MDL240 to RX3i MDL250 Harness Assembly 24
- 3.5.1 Discrete Input Modules 24
- 3.5.2 Specification Comparison 25
- 3.5.3 Pin Mapping 26

3.6 IC695CRH005 – 90-70 MDL251 to RX3i MDL240 Harness Assembly 27
- 3.6.1 Discrete Input Modules 27
- 3.6.2 Specification Comparison 28
- 3.6.3 Pin Mapping 29

3.7 IC695CRH006 – 90-70 MDL251 to RX3i MDL250 Harness Assembly 30
- 3.7.1 Discrete Input Modules 30
- 3.7.2 Specification Comparison 31
- 3.7.3 Pin Mapping 31

3.8 IC695CRH007 – 90-70 MDL241 to RX3i MDL231 Harness Assembly 33
- 3.8.1 Discrete Input Modules 33
- 3.8.2 Specification Comparison 34
- 3.8.3 Pin Mapping 35

3.9 IC695CRH008 – 90-70 MDL653 to RX3i MDL660 Harness Assembly 36
- 3.9.1 Discrete Input Modules 36
- 3.9.2 Specification Comparison 37
- 3.9.3 Pin Mapping 38

Contents

3.10 IC695CRH009 – 90-70 MDL652 to RX3i MDL654 Harness Assembly 39
3.10.1 Discrete Input Modules 39
3.10.2 Specification Comparison 40
3.10.3 Pin Mapping 41

3.11 IC695CRH010 – 90-70 MDL654 to RX3i MDL658 Harness Assembly 42
3.11.1 Discrete Input Modules 42
3.11.2 Specification Comparison 43
3.11.3 Pin Mapping 44

3.12 IC695CRH011 – 90-70 MDL640 to RX3i MDL632 Harness Assembly 45
3.12.1 Discrete Input Modules 45
3.12.2 Specification Comparison 46
3.12.3 Pin Mapping 47

3.13 IC695CRH013 – 90-70 MDL671 to RX3i MDL645 Harness Assembly 48
3.13.1 Discrete Input Modules 48
3.13.2 Specification Comparison 49
3.13.3 Pin Mapping 50

3.14 IC695CRH014 – 90-70 MDL350 to RX3i MDL340 Harness Assembly 51
3.14.1 Discrete Output Modules 51
3.14.2 Specification Comparison 52
3.14.3 Pin Mapping 53

3.15 IC695CRH015 – 90-70 MDL340 to RX3i MDL330 Harness Assembly 54
3.15.1 Discrete Output Modules 54
3.15.2 Specification Comparison 55
3.15.3 Pin Mapping 56

3.16 IC695CRH016 – 90-70 MDL340 to RX3i MDL350 Harness Assembly 57
3.16.1 Discrete Output Modules 57
3.16.2 Specification Comparison 58
3.16.3 Pin Mapping 59

3.17 IC695CRH017 – 90-70 MDL341 to RX3i MDL350 Harness Assembly 60
3.17.1 Discrete Output Modules 60
3.17.2 Specification Comparison 61
3.17.3 Pin Mapping 62

3.18 IC695CRH018 – 90-70 MDL341 to RX3i MDL390 Harness Assembly 63
3.18.1 Discrete Output Modules 63
3.18.2 Specification Comparison 64
3.18.3 Pin Mapping 65

3.19 IC695CRH019 – 90-70 MDL752 to RX3i MDL753 Harness Assembly 66
3.19.1 Discrete Output Modules 66
3.19.2 Specification Comparison 67
3.19.3 Pin Mapping 68

3.20 IC695CRH020 – 90-70 MDL750 to RX3i MDL753 Harness Assembly 69
3.20.1 Discrete Output Modules 69
3.20.2 Specification Comparison 70
3.20.3 Pin Mapping 71

3.21 IC695CRH022 – 90-70 MDL940 to RX3i MDL916 Harness Assembly 72
3.21.1 Discrete Output Modules 72
3.21.2 Specification Comparison 73
3.21.3 Pin Mapping 74

3.22 IC695CRH023 – 90-70 ALG230 to RX3i ALG616 Harness Assembly 75
3.22.1 Analog Input Modules 75
3.22.2 Specification Comparison 76
3.22.3 Pin Mapping 77

3.23 IC695CRH024 – 90-70 ALG230 to RX3i ALG220 Harness Assembly 78
3.23.1 Analog Input Modules 78
3.23.2 Specification Comparison 79
3.23.3 Pin Mapping 80

3.24 IC695CRH025 – 90-70 ALG230 to RX3i ALG221 Harness Assembly 81
3.24.1 Analog Input Modules 81
3.24.2 Specification Comparison 82
3.24.3 Pin Mapping 83

3.25 IC695CRH026 – 90-70 ALG230 to RX3i ALG222 Harness Assembly 84
3.25.1 Analog Input Modules 84
3.25.2 Specification Comparison 85
3.25.3 Pin Mapping 86

3.26 IC695CRH027 – 90-70 ALG230 to RX3i ALG232 Harness Assembly 87
3.26.1 Analog Input Modules 87
3.26.2 Specification Comparison 88
3.26.3 Pin Mapping 89

3.27 IC695CRH028 – 90-70 ALG440 to RX3i ALG616 Harness Assembly 90
3.27.1 Analog Input Modules 90
3.27.2 Specification Comparison 91
3.27.3 Pin Mapping 92

3.28 IC695CRH029 – 90-70 ALG440 to RX3i ALG220 Harness Assembly 93
3.28.1 Analog Input Modules 93
3.28.2 Specification Comparison 94
3.28.3 Pin Mapping 95

3.29 IC695CRH030 – 90-70 ALG440 to RX3i ALG221 Harness Assembly 96
3.29.1 Analog Input Modules 96
3.29.2 Specification Comparison 97
3.29.3 Pin Mapping 98

3.30 IC695CRH031 – 90-70 ALG441 to RX3i ALG616 Harness Assembly 99
3.30.1 Analog Input Modules 99
3.30.2 Specification Comparison 100
3.30.3 Pin Mapping 101

3.31 IC695CRH032 – 90-70 ALG441 to RX3i ALG220 Harness Assembly 102
3.31.1 Analog Input Modules 102
3.31.2 Specification Comparison 103
3.31.3 Pin Mapping 104

3.32 IC695CRH033 – 90-70 ALG441 to RX3i ALG222 Harness Assembly 105
3.32.1 Analog Input Modules 105
3.32.2 Specification Comparison 106
3.32.3 Pin Mapping 107

3.33 IC695CRH034 – 90-70 ALG441 to RX3i ALG232 Harness Assembly 108
3.33.1 Analog Input Modules 108
3.33.2 Specification Comparison 109
3.33.3 Pin Mapping 110

3.34 IC695CRH035 – 90-70 ALG320 to RX3i ALG708 Harness Assembly 111
3.34.1 Analog Output Modules 111
3.34.2 Specification Comparison 112
3.34.3 Pin Mapping 113

3.35 IC695CRH036 – 90-70 ALG320 to RX3i ALG390 Harness Assembly 114
3.35.1 Analog Output Modules 114
3.35.2 Specification Comparison 115
3.35.3 Pin Mapping 116

3.36 IC695CRH037 – 90-70 ALG320 to RX3i ALG391 Harness Assembly 117
3.36.1 Analog Output Modules 117
3.36.2 Specification Comparison 118
3.36.3 Pin Mapping 119

3.37 IC695CRH038 – 90-70 MDL740 to RX3i MDL765 Harness Assembly 120
3.37.1 Discrete Output Modules 120
3.37.2 Specification Comparison 121
3.37.3 Pin Mapping 122

3.38 IC695CRH039 – 90-70 MDL753 to RX3i MDL765 Harness Assembly 123
3.38.1 Discrete Output Modules 123
3.38.2 Specification Comparison 124
3.38.3 Pin Mapping 125

4. Agency Approvals and Government Regulations 126

4.1 Agency Approvals 126

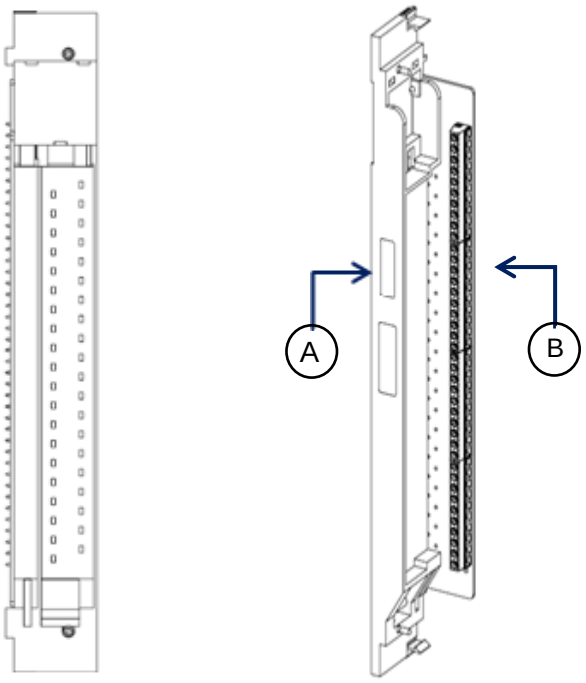
4.2 Agency Warnings and Installation Guidelines 126

1. Introduction

The Series 90-70 to RX3i I/O Adapter Card IC695ACC651, along with the Conversion Rack IC695ACC650, functions as a bridge to connect existing Series 90-70 field wiring to RX3i I/O modules.

1.1 Adapter Card Features

- Compatible with Series 90-70 I/O terminal blocks
- Supports Series 90-70 Discrete I/O and Analog I/O Modules (refer to Section 3 for a list of supported modules).
- Supports up to 240V 8A connections to I/O modules.
- Surrounding Air Temperature Rating: 60˚C



A: Connectors for Series 90-70 TB assembly

B: Terminal block for connecting to RX3i module terminal header

Figure 1: Series 90-70 to RX3i I/O Adapter Card

1.2 Additional Information

The following user manuals and other product documentation are available on the Support website.

Series 90-70 to RX3i Conversion Rack Important Product Information, GFK-2792

PACSystems RX3i System Manual, GFK-2314

Series 90-70 Programmable Controller Data Sheet Manual, GFK-0600

Series 90-70 Programmable Controller Installation Manual, GFK-0262

2. Installation & Setup

The Series 90-70 I/O terminal block assembly with field wiring retained from the existing Series 90-70 installation should be plugged in to item A of the adapter card (shown in Figure 1). The other side of the I/O adapter card has 5mm pitch terminal blocks (item B in Figure 1, that can be used to connect wires to the RX3i I/O module terminal headers. For integration with the Conversion Rack refer to GFK-2792 for further details.

2.1 I/O Adapter Card Installation

The IC695ACC651 I/O Adapter Cards have molded latches that automatically snap onto the upper and lower rails of the conversion rack (IC695ACC650) when the module is fully inserted. Use the included M2.5x11 collar screws to secure the adapter cards to the rack.

2.2 Removing an I/O Adapter Card

Warning

Remove the power supply connected to the Series 90-70 rack before disconnecting terminal blocks or removing an Adapter card.

Even if the power supply is switched off, hazardous voltages from user field wiring may still be present on the I/O terminal boards as well as on the power supply terminal board. Care should be taken when handling the power supply and I/O modules as well as any wiring connected to them in order to prevent personal injury.

The instructions below should be followed when removing an I/O Adapter Card from its slot in a rack.

- If the series 90-70 I/O terminal block assembly is already connected to the I/O adapter card, first remove it by turning the jackscrew counterclockwise until it is completely disengaged.
- Gently pull the series 90-70 I/O terminal block assembly from the bottom of the conversion rack which is open.
- Unscrew the M2.5x11 collar screws on the I/O adapter card.
- Grasp the I/O adapter card firmly at the top and bottom of the board cover with your thumbs on the front of the cover and your fingers on the plastic clips on the back of the cover.
- Squeeze the rack clips on the back of the cover with your fingers to disengage the clip from the rack rail and pull the board firmly to remove it from the backplane connector.
- Slide the board along the card guide and remove it from the rack.
- Do not use the hinged door to remove the terminal board. The door could be damaged if this is done.

2.3 Wiring Procedures

The following procedures should be used when connecting the wiring between the terminal connectors on the adapter board and RX3i terminal block.

1. Turn off power before wiring the terminal connectors.
2. Choose the appropriate RX3i terminal block or blocks. Refer to the *PACSystems RX3i System Manual,* GFK-2314 for details.
3. The terminal connector on the I/O adapter card (item B in Figure 1), accepts wire sizes from AWG #22 (0.36 mm^2) through AWG #14 (2.10 mm^2). When using AWG #14 (2.10 mm^2) wire for wiring all points, do not exceed a maximum insulation diameter of 0.135 inch (3.43mm). To ensure proper connection, two wires may be terminated at one terminal only if both wires are the same size.
4. The torque recommended for the I/O terminal board connection screws and the I/O adapter card Terminal Block are as follows

Connector	*Description*	*Torque (min.)*	*Torque (max.)*
44B740021-G01R01	RX3i 20PT Terminal Block	9.6 in-lbs (1.1 Nm)	11.5 in-lbs (1.3 Nm)
IC694TBB032/TBB132	RX3i 36PT Terminal Block	-	7 in-lbs (0.79 Nm)
42G8401-0067	CONN TB 1X10 5MM on I/O Adapter Card	4.4in-lbs (0.5Nm)	5.31 in-lbs (0.6Nm)

5. For the ALG modules, to minimize capacitive loading and noise, all field connections should be wired using a good grade of twisted, shielded instrumentation cable. The shields should be connected to GND on the user terminal connector block.

   Follow the wiring connections mapping provided in the following sections for each Series 90-70 I/O module to that of the equivalent RX3i I/O module.
6. After the wiring is completed from the I/O adapter card to the RX3i terminal strips, open the hinged RX3i mounting plate on the adapter rack, insert the adapter card in the rack and gently pull the RX3i terminals connected to the other side of the wire, from the bottom of the rack, which is open. To secure the I/O Adapter card, refer to the procedures in section 2.1.
7. To connect the Series 90-70 I/O header assembly with field wiring to the I/O adapter card, open the hinged door on the rack, pull the Series 90-70 I/O terminal block assembly with field wiring from the bottom of the rack and insert into the I/O adapter card. Secure the Series 90-70 terminal block assembly by turning the jackscrew clockwise until it is engaged.
8. Close and secure the hinged RX3i mounting plate on the rack. Tighten the captive screws with a torque of 2.5Nm.
9. Connect the RX3i terminal blocks to the RX3i modules.
10. Add tie wraps at base of the mounting bracket where holes are provided on the Conversion rack (IC695ACC650) to hold the wire bundle intact from the RX3i module to the I/O adapter card. Add additional cable ties along the length of wire bundle.
11. After completing wiring connections to all modules in a rack, the wire bundle with field wiring must be secured. To ensure that the wire bundle is secured properly, it is recommended that a cable tie be wrapped around the wire bundle and tightly secured through the cable tie cleat at the bottom of the terminal board. For extremely large wire bundles, additional cable ties should be used.

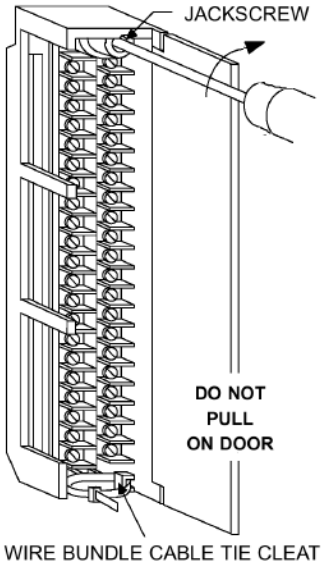


Figure 2: Series 90-70 I/O Terminal Board

3. Supported Modules for Migration

The mapping of connectors and wiring diagram for each of the Series 90-70 I/O modules to RX3i I/O modules is provided in the following sections.

Notes:

- The module mappings provided are the most optimal recommended solutions and apply to installations that conform to the *Series 90-70 Programmable Controller Installation Manual,* GFK-0262 and the information in the *Series 90-70 Programmable Controller Data Sheet Manual,* GFK-0600. It is the customer's responsibility to validate their installation for compliance to agency requirements.
- It is recommended to review the isolation specs for discrete modules and Form A and C applications for relay modules when configuring the RX3i system.
- Some applications require more than one RX3i module to transfer the Series 90-70 I/O. In these cases, adjustments must be made in the user's program.

3.1 RX3i I/O Replacements for Series 90-70 I/O

Series 90-70 I/O Module	Module Type	RX3i I/O Module	Wiring Harness
IC697ALG230	Analog Input	IC694ALG220	IC695CRH024
		IC694ALG221	IC695CRH025
		IC694ALG222	IC695CRH026
		IC694ALG232	IC695CRH027
		IC695ALG616	IC695CRH023
IC697ALG320	Analog Output	IC694ALG390	IC695CRH036
		IC694ALG391	IC695CRH037
		IC695ALG708	IC695CRH035
IC697ALG440	Analog Input	IC694ALG220	IC695CRH029
		IC694ALG221	IC695CRH030
		IC695ALG616	IC695CRH028
IC697ALG441	Analog Input	IC694ALG220	IC695CRH032
		IC694ALG222	IC695CRH033
		IC694ALG232	IC695CRH034
		IC695ALG616	IC695CRH031
IC697MDL240	Discrete Input	IC694MDL250	IC695CRH004
IC697MDL241	Discrete Input	IC694MDL231	IC695CRH007
IC697MDL250	Discrete Input	IC694MDL260	IC695CRH003
IC697MDL251	Discrete Input	IC694MDL240	IC695CRH005
		IC694MDL250	IC695CRH006
IC697MDL252	Discrete Input	IC694MDL241	IC695CRH001
IC697MDL253	Discrete Input	IC694MDL241	IC695CRH002
IC697MDL340	Discrete Output	IC694MDL330	IC695CRH015
		IC694MDL350	IC695CRH016
IC697MDL341	Discrete Output	IC694MDL350	IC695CRH017
		IC694MDL390	IC695CRH018
IC697MDL350	Discrete Output	IC694MDL340	IC695CRH014
IC697MDL640	Discrete Input	IC694MDL632	IC695CRH011

Series 90-70 I/O Module	Module Type	RX3i I/O Module	Wiring Harness
IC697MDL652	Discrete Input	IC694MDL654	IC695CRH009
IC697MDL653	Discrete Input	IC694MDL660	IC695CRH008
IC697MDL654	Discrete Input	IC694MDL568	IC695CRH010
IC697MDL671	Discrete Input	IC694MDL645	IC695CRH013
IC697MDL740	Discrete Output	IC695MDL765	IC695CRH038
IC697MDL750	Discrete Input	IC694MDL753	IC695CRH020
IC697MDL752	Discrete Input	IC694MDL753	IC695CRH019
IC697MDL753	Discrete Output	IC695MDL765	IC695CRH039
IC697MDL940	Discrete Input	IC694MDL916	IC695CRH022

Note: The number of RX3i Modules required to replace the respective Series 90-70 I/O module is indicated in the Pin Mapping tables as RX3i Module1, RX3i Module 2 etc.

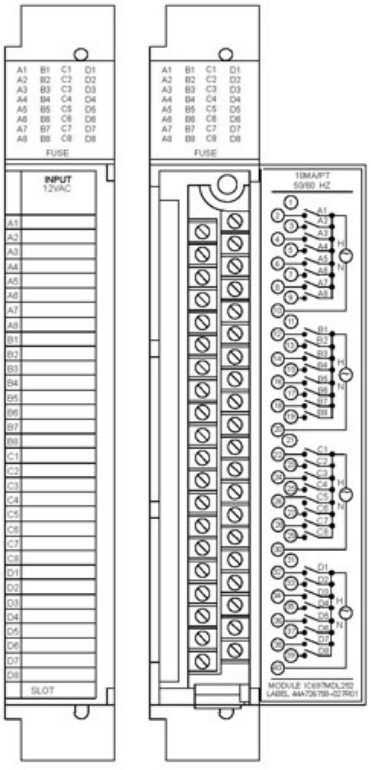
Similarly the Terminal Blocks (TBs) for the RX3i modules in the Pin Mapping table are identified with suffixes that indicate the corresponding RX3i module.

3.2 IC695CRH001 – 90-70 MDL252 to RX3i MDL241 Harness Assembly

3.2.1 Discrete Input Modules

12VAC, 32Pt

IC697MDL252



The 12 volt AC Input module provides 32 input

24VAC/VDC, 16Pt, Pos/Neg

IC694MDL241

The 24VAC/VDC 16 Point C

points in four isolated groups of eight points each. This allows each group of eight points to be used on a different phase of the AC supply.

The input is resistive with current-voltage characteristics which meet IEC standard (type 1). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

Positive/Negative Logic Input module, IC694MDL241, provides 16 input points in one group with a common power input terminal. This module can be used with AC or DC field inputs. In DC mode, it can be wired for either positive or negative logic. Input characteristics are compatible with a wide range of input devices, such as pushbuttons, limit switches, and electronic proximity switches.

Current into an input point results in a logic 1 in the input status table (%I). Power to operate AC input devices must be supplied by the user. DC Inputs can be powered by the backplane 24V supply.

3.2.2 Specification Comparison

Specification	IC697MDL252	IC694MDL241	Notes
Rated Voltage:	12 VAC, 47 to 63 Hz Sinusoidal	24 volts AC or 24 volts DC (**Input Voltage Range:** 0 to +30 volts DC or 0 to +30 VAC, 50/60Hz)	
Inputs per Module:	32 (four groups of eight inputs each)	16 (one group with a single common)	The 4 input groups must have the same power supply.
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous 1500 VAC for one minute	2 Module Replacement
Input Current:	10 mA (typical) at rated voltage	7 mA (typical) at rated voltage	
Input Impedance:	1.12K ohms typical Input		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	7.5 to 15 volts RMS, 47 to 63 Hz Sinusoidal 0 to 2.5 volts RMS, 47 to 63 Hz Sinusoidal 6 mA to 15 mA 0 to 2.5mA (2mA min at 2.5V input) 20 ms typical	1.5 to 30 volts AC or DC 0 to +4 volts AC or DC 3.2 mA minimum 1 mA maximum 12 ms typical 28 ms typical	Correct operation of the replacement card requires the input voltage of 12-30 VAC.
Power Consumption: 5V	0.3 amps	80 mA (all inputs on) from 5 volt bus on backplane	
		125 mA from the Isolated 24 volt backplane bus or from user supplied power	
VME	System designed to support the VME standard C.1		

3.2.3 Pin Mapping

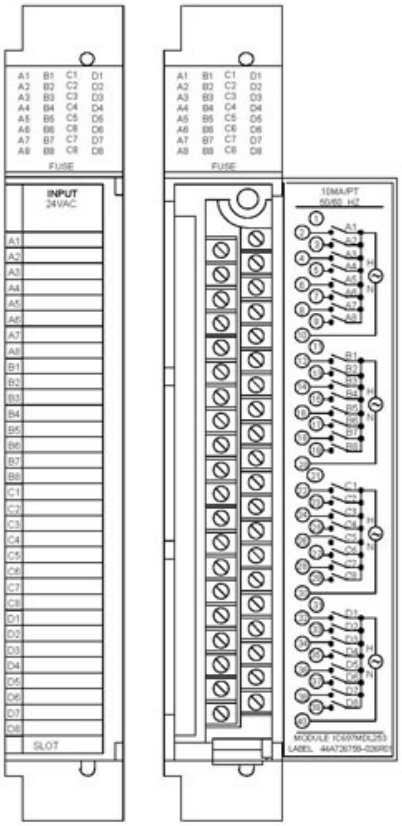
IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL252		IC694MDL241		IC694MDL241	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	A2	3	I2		
4	A3	4	I3		
5	A4	5	I4		
6	A5	6	I5		
7	A6	7	I6		
8	A7	8	I7		
9	A8	9	I8		
10	N	1	COM		
11	NC				
12	B1	10	I9		
13	B2	11	I10		
14	B3	12	I11		
15	B4	13	I12		
16	B5	14	I13		
17	B6	15	I14		
18	B7	16	I15		
19	B8	17	I16		
20	N	1	COM		
21	NC				
22	C1			2	I1
23	C2			3	I2
24	C3			4	I3
25	C4			5	I4
26	C5			6	I5
27	C6			7	I6
28	C7			8	I7
29	C8			9	I8
30	N			1	COM
31	NC				
32	D1			10	I9
33	D2			11	I10
34	D3			12	I11
35	D4			13	I12
36	D5			14	I13
37	D6			15	I14
38	D7			16	I15
39	D8			17	I16
40	N			1	COM

3.3 IC695CRH002 – 90-70 MDL253 to RX3i MDL241 Harness Assembly

3.3.1 Discrete Input Modules

24VAC, 32Pt

IC697MDL253



The 24 volt AC Input module provides 32 input points in four isolated groups of eight points each. This allows each group of eight points to be used on a different phase of the AC supply.

The input is resistive with current-voltage characteristics which meet IEC standard (type 1). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

24VAC/VDC, 16Pt, Pos/Neg

IC694MDL241

The 24VAC/VDC 16 Point C Positive/Negative Logic Input module, IC694MDL241, provides 16 input points in one group with a common power input terminal. This module can be used with AC or DC field inputs. In DC mode, it can be wired for either positive or negative logic. Input characteristics are compatible with a wide range of input devices, such as pushbuttons, limit switches, and electronic proximity switches.

Current into an input point results in a logic 1 in the input status table (%I). Power to operate AC input devices must be supplied by the user. DC Inputs can be powered by the backplane 24V supply

3.3.2 Specification Comparison

Specification	IC697MDL253	IC694MDL241	Notes
Rated Voltage:	24 VAC, 47 to 63 Hz Sinusoidal	24 volts AC or 24 volts DC	
Inputs per Module:	32 (four groups of eight inputs each)	16 (one group with a single common)	2 Module Replacement
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous 1500 VAC for one minute	
Input Current:	10 mA (typical) at rated voltage	7 mA (typical) at rated voltage	
Input Impedance:	2.6K ohms typical Input		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	13.5 to 30 volts RMS, 47 to 63 Hz Sinusoidal 0 to 5 volts RMS, 47 to 63 Hz Sinusoidal 6 mA to 15 mA 0 to 2 mA (2 mA min at 5 V input) 20 ms typical	1.5 to 30 volts AC or DC 0 to +4 volts AC or DC 3.2 mA minimum 1 mA maximum 12 ms typical 28 ms typical	
Power Consumption: 5V	0.3 amps	80 mA (all inputs on) from 5 volt bus on backplane	
		125 mA from the Isolated 24 volt backplane bus or from user supplied power	
VME	System designed to support the VME standard C.1		

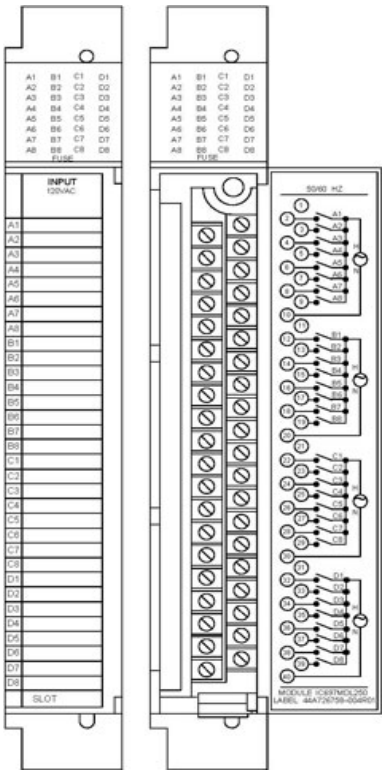
3.3.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL253		IC694MDL241		IC694MDL241	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	A2	3	I2		
4	A3	4	I3		
5	A4	5	I4		
6	A5	6	I5		
7	A6	7	I6		
8	A7	8	I7		
9	A8	9	I8		
10	N	1	COM		
11	NC				
12	B1	10	I9		
13	B2	11	I10		
14	B3	12	I11		
15	B4	13	I12		
16	B5	14	I13		
17	B6	15	I14		
18	B7	16	I15		
19	B8	17	I16		
20	N	1	COM		
21	NC				
22	C1			2	I1
23	C2			3	I2
24	C3			4	I3
25	C4			5	I4
26	C5			6	I5
27	C6			7	I6
28	C7			8	I7
29	C8			9	I8
30	N			1	COM
31	NC				
32	D1			10	I9
33	D2			11	I10
34	D3			12	I11
35	D4			13	I12
36	D5			14	I13
37	D6			15	I14
38	D7			16	I15
39	D8			17	I16
40	N			1	COM

3.4 IC695CRH003 – 90-70 MDL250 to RX3i MDL260 Harness Assembly

3.4.1 Discrete Input Modules

120VAC, 32Pt, IC697MDL250

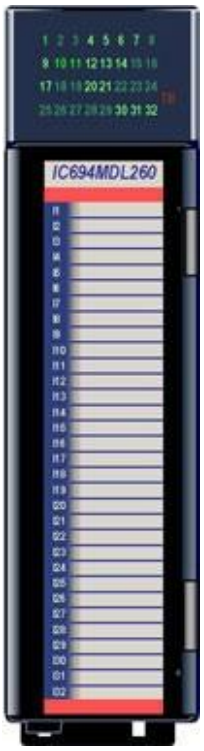


The 120 volt AC Input module for the programmable controller provides 32 input points in four isolated groups of eight points each. This allows each group of eight points to be used on a different phase of the AC supply.

The input is reactive (resistor/capacitor input) with current-voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

120VAC, 32Pt, IC694MDL260



The 120VAC Grouped Input module, IC694MDL260, provides 32 discrete input points. The inputs are arranged in four isolated groups of eight. Isolation is provided between the four groups of inputs, however all inputs within a group are referenced to the same user common connection.

Input filter times can be set from the programmer using the module's assigned output data references.

3.4.2 Specification Comparison

Specification	IC697MDL250	IC694MDL260	Notes
Rated Voltage:	120 VAC, 47 to 63 Hz Sinusoidal	120 volts AC	
Inputs per Module:	32 (four groups of eight inputs each)	32 (four isolated groups of 8 inputs)	
Isolation:		20 ms to 2540 ms in 20 ms increments. Sent from CPU.	
Input Current:	1500 volts RMS any input to backplane 500 volts RMS between input groups	264 VAC continuous; 1500 VAC for one minute	
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	75 - 132 volts AC, 47 - 63 Hz Sinusoidal 0 - 25 volts AC, 47 - 63 Hz Sinusoidal 6 mA to 15 mA 0 - 3 mA (2.2 minimum at 25 V input) 20 ms typical	70 to 132 VAC 0 to 20 VAC 5 mA minimum 2.5 mA maximum +0-1 AC cycles filter up to 840 ms +1-2 AC cycles filter 840 to 1600 ms +2-3 AC cycles filter 1600 to 1920 ms +3-4 AC cycles filter 1920 ms or more	RX3i programmable filter
Power Consumption: 5V	0.35 amps	220mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.4.3 Pin Mapping

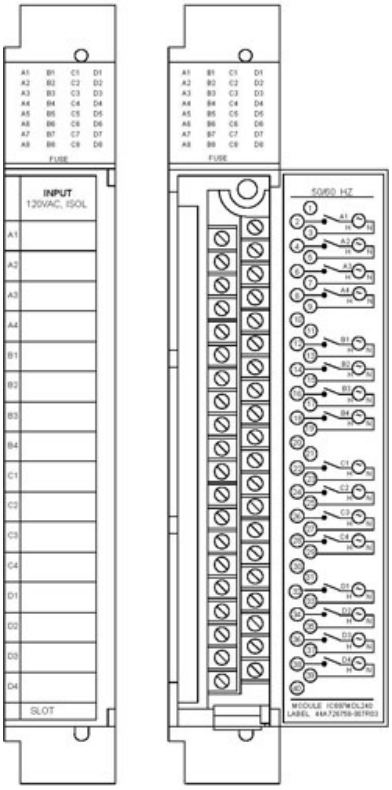
IC695ACC651		RX3i Module1	
IC697MDL250		IC694MDL260	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	2	I2
4	A3	3	I3
5	A4	4	I4
6	A5	5	I5
7	A6	6	I6
8	A7	7	I7
9	A8	8	I8
10	N	9	COM
11	NC		
12	B1	10	I9
13	B2	11	I10
14	B3	12	I11
15	B4	13	I12
16	B5	14	I13
17	B6	15	I14
18	B7	16	I15
19	B8	17	I16
20	N	18	COM
21	NC		
22	C1	19	I17
23	C2	20	I18
24	C3	21	I19
25	C4	22	I20
26	C5	23	I21
27	C6	24	I22
28	C7	25	I23
29	C8	26	I24
30	N	27	COM
31	NC		
32	D1	28	I25
33	D2	29	I26
34	D3	30	I27
35	D4	31	I28
36	D5	32	I29
37	D6	33	I30
38	D7	34	I31
39	D8	35	I32
40	N	36	COM

3.5 IC695CRH004 – 90-70 MDL240 to RX3i MDL250 Harness Assembly

3.5.1 Discrete Input Modules

120VAC, 16Pt, Isolated

IC697MDL240



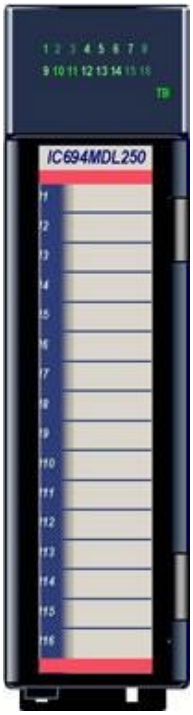
The 120 Volt AC Isolated Input Module provides 16 input points which are isolated. This allows each point to be used on a different phase of the AC supply.

The input is reactive (resistor/capacitor input) with current-voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

120VAC, 16Pt, Isolated

IC694MDL250



The 120VAC 16-Point Isolated Input module, IC694MDL250, provides 16 isolated input points. Input points can be used on different phases of the AC supply or powered from the same supply. An RC snubber protects each input against transient electrical noise on the power line.

The module's input filtering time can be changed during system operation by the application program. No DIP switch settings are required

3.5.2 Specification Comparison

Specification	IC697MDL240	IC694MDL250	Notes
Rated Voltage:	120 volts AC, 60 Hz sinusoidal	120 volts AC	
Inputs per Module:	16 individually isolated	16 isolated	
Input Filter Times		20 ms to 2540 ms in 20 ms increments. Sent from CPU.	
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	10 mA (typical) at rated voltage (reactive)	7.0 mA per point (typical) at rated voltage	
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	75 volts to 132 volts, 60 Hz sinusoidal 0 to 20 volts, 60 Hz sinusoidal 8 mA to 15 mA 0 - 4 mA (2.2 minimum at 25 V input) 20 ms typical	70 to 132 VAC 0 to 20 VAC 5 mA minimum 2.5 mA maximum +0-1 AC cycles filter up to 840 ms +1-2 AC cycles filter 840 to 1600 ms +2-3 AC cycles filter 1600 to 1920 ms +3-4 AC cycles filter 1920 ms or more	RX3i programmable filter
Power Consumption: 5V	0.25 amps	220mA with all inputs on	
VME	System designed to support the VME standard C.1		

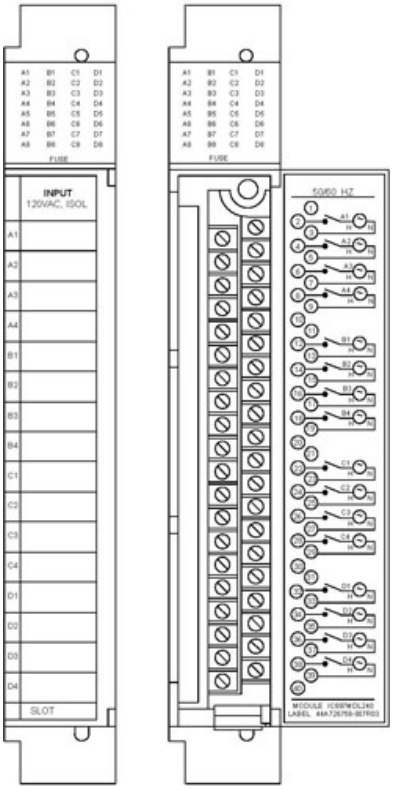
3.5.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL240		IC694MDL250	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	N	2	I1RTN
4	A2	3	I2
5	N	4	I2RTN
6	A3	5	I3
7	N	6	I3RTN
8	A4	7	I4
9	N	8	I4RTN
10	NC	9	
11	NC		
12	B1	10	I5
13	N	11	I5RTN
14	B2	12	I6
15	N	13	I6RTN
16	B3	14	I7
17	N	15	I7RTN
18	B4	16	I8
19	N	17	I8RTN
20	NC	18	
21	NC		
22	C1	19	I9
23	N	20	I9RTN
24	C2	21	I10
25	N	22	I10RTN
26	C3	23	I11
27	N	24	I11RTN
28	C4	25	I12
29	N	26	I12RTN
30	NC	27	
31	NC		
32	D1	28	I13
33	N	29	I13RTN
34	D2	30	I14
35	N	31	I14RTN
36	D3	32	I15
37	N	33	I15RTN
38	D4	34	I16
39	N	35	I16RTN
40	NC	36	

3.6 IC695CRH005 – 90-70 MDL251 to RX3i MDL240 Harness Assembly

3.6.1 Discrete Input Modules

120VAC, 16Pt,
IC697MDL251

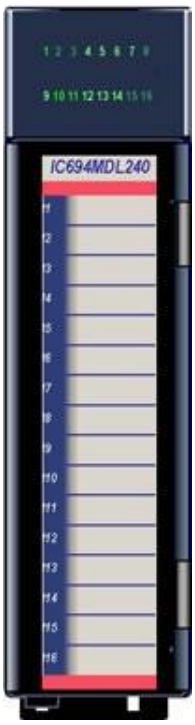


This 120 volt AC Input module provides 16 input points in four isolated groups of four points each. This allows each group of four points to be used on a different phase of the AC supply.

The input is reactive (resistor/capacitor input) with current-voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

120VAC, 16Pt,
IC694MDL240



The 120 volt AC Input module, IC694MDL240, provides 16 input points with one common power input terminal. The input circuits are reactive (resistor/capacitor) inputs. Current into an input point results in a logic 1 in the input status table (%I). Input characteristics are compatible with a wide range of input devices, such as push buttons, limit switches, and electronic proximity switches.

Power to operate the field devices must be supplied by the user. This module requires an AC power source; it cannot be used with a DC power source.

3.6.2 Specification Comparison

Specification	IC697MDL251	IC694MDL240	Notes
Rated Voltage:	120 VAC, 47 to 63 Hz Sinusoidal	120 volts AC	
Inputs per Module:	16 (four groups of four inputs each)	16 (one group with a single common)	All on Single Common
Input Filter Times		20 ms to 2540 ms in 20 ms increments. Sent from CPU.	
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	10 mA (typical) at rated voltage (reactive)	12 mA (typical) at rated voltage	
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current	75 - 132 volts AC, 47 - 63 Hz Sinusoidal 0 - 25 volts AC, 47 - 63 Hz Sinusoidal 6 mA to 15 mA 0 - 3 mA (2.2 minimum at 25 V input) 20 ms typical	74 to 132 VAC 0 to 20 VAC 6 mA minimum 2.2 mA maximum 30 ms maximum 45 ms maximum	
Power Consumption: 5V	0.35 amps	90 mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.6.3 Pin Mapping

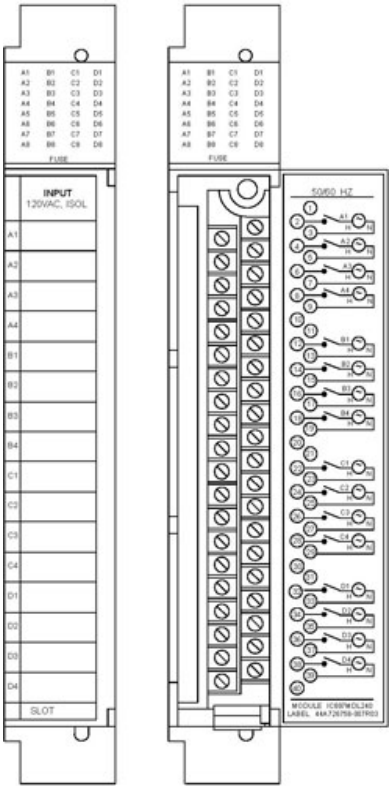
IC695ACC651		***RX3i Module1***	
IC697MDL251		***IC694MDL240***	
Terminals		***Terminals (TB1)***	
1	NC		
2	A1	1	I1
3	A2	2	I2
4	A3	3	I3
5	A4	4	I4
6	NC		
7	NC		
8	NC		
9	NC		
10	N	19	N
11	NC		
12	B1	5	I5
13	B2	6	I6
14	B3	7	I7
15	B4	8	I8
16	NC		
17	NC		
18	NC		
19	NC		
20	N	19	N
21	NC		
22	C1	9	I9
23	C2	10	I10
24	C3	11	I11
25	C4	12	I12
26	NC		
27	NC		
28	NC		
29	NC		
30	N	19	N
31	NC		
32	D1	I3	I13
33	D2	I4	I14
34	D3	I5	I15
35	D4	I6	I16
36	NC		
37	NC		
38	NC		
39	NC		
40	N	19	N

3.7 IC695CRH006 – 90-70 MDL251 to RX3i MDL250 Harness Assembly

3.7.1 Discrete Input Modules

120VAC, 16Pt,

IC697MDL251



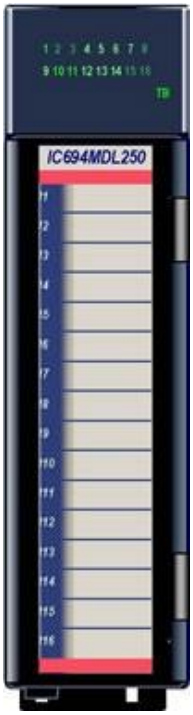
The 120 Volt AC Isolated Input Module provides 16 input points which are isolated. This allows each point to be used on a different phase of the AC supply.

The input is reactive (resistor/capacitor input) with current-voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

120VAC, 16Pt, Isolated

IC694MDL250



The 120VAC 16-Point Isolated Input module, IC694MDL250, provides 16 isolated input points. Input points can be used on different phases of the AC supply or powered from the same supply. An RC snubber protects each input against transient electrical noise on the power line.

The module's input filtering time can be changed during system operation by the application program. No DIP switch settings are required

3.7.2 Specification Comparison

Specification	IC697MDL251	IC694MDL250	Notes
Rated Voltage:	120 VAC, 47 to 63 Hz Sinusoidal	120 volts AC	
Inputs per Module:	16 (four groups of four inputs each)	16 isolated	
Input Filter Times		20 ms to 2540 ms in 20 ms increments. Sent from CPU.	
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	10 mA (typical) at rated voltage (reactive)	7.0 mA per point (typical) at rated voltage	
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	75 - 132 volts AC, 47 - 63 Hz Sinusoidal 0 - 25 volts AC, 47 - 63 Hz Sinusoidal 6 mA to 15 mA 0 - 3 mA (2.2 minimum at 25 V input) 20 ms typical	70 to 132 VAC 0 to 20 VAC 5 mA minimum 2.5 mA maximum +0-1 AC cycles filter up to 840 ms +1-2 AC cycles filter 840 to 1600 ms +2-3 AC cycles filter 1600 to 1920 ms +3-4 AC cycles filter 1920 ms or more	
Power Consumption: 5V	0.35 amps	220mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.7.3 Pin Mapping

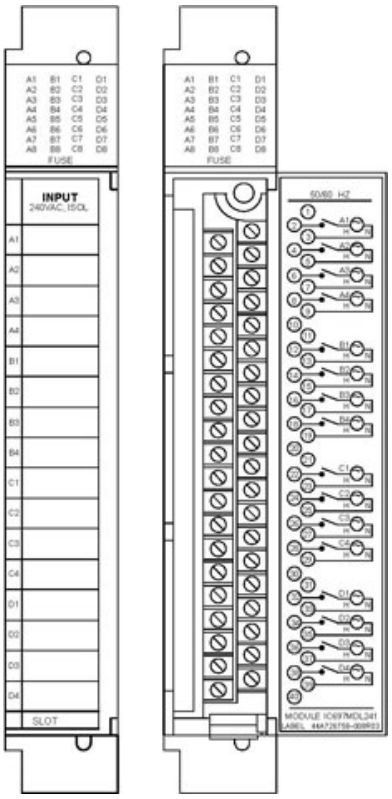
IC695ACC651		RX3i Module1	
IC697MDL251		IC694MDL250	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	3	I2
4	A3	5	I3
5	A4	7	I4
6	A3		
7	NC		
8	NC		
9	NC		
10	N	2	I1RTN

IC695ACC651		RX3i Module1	
IC697MDL251		IC694MDL250	
Terminals		Terminals (TB1)	
		4	I2RTN
		6	I3RTN
		8	I4RTN
11	NC		
12	B1	9	I5
13	B2	10	I6
14	B3	11	I7
15	B4	12	I8
16	NC	13	
17	NC	14	
18	NC	15	
19	NC	16	
20	N	10	I5RTN
		12	I6RTN
		14	I7RTN
		16	I8RTN
21	NC		
22	C1	19	I9
23	C2	21	I10
24	C3	23	I11
25	C4	25	I12
26	NC		
27	NC		
28	NC		
29	NC		
30	N	20	9RTN
		22	10RTN
		24	11RTN
		26	I2RTN
31	NC		
32	D1	27	I13
33	D2	29	I14
34	D3	31	I15
35	D4	33	I16
36	NC		
37	NC		
38	NC		
39	NC		
40	N	28	I13RTN
		30	I14RTN
		32	I15RTN
		34	I16RTN

3.8 IC695CRH007 – 90-70 MDL241 to RX3i MDL231 Harness Assembly

3.8.1 Discrete Input Modules

240VAC, Isolated, 16Pt, IC697MDL241



This 240 volt AC Isolated Input module for use with a Programmable Logic Controller (PLC) provides 16 isolated input points. This allows each point to be used on a different phase of the AC supply.

The input is reactive (resistor/capacitor input) with current-voltage characteristics which meet IEC standard (type 2). The input characteristics are compatible with a large range of available proximity switches.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

240VAC, 8Pt, Isolated IC694MDL231

The 240 volt AC Isolated Input module, IC694MDL231, provides 8 isolated input points, each with a common power input terminal. The input circuits are reactive (resistor/capacitor) inputs. Current into an input point results in a logic 1 in the input status table (%I). Input characteristics are compatible with a wide range of input devices, such as pushbuttons, limit switches, and electronic proximity switches.

Because the inputs are isolated, each input can be powered by a separate AC power source. Power to operate the field devices must be supplied by the user. This module requires an AC power source

3.8.2 Specification Comparison

Specification	IC697MDL241	IC694MDL231	Notes
Rated Voltage:	240 VAC, 60 Hz Sinusoidal	240 volts AC, 50/60 Hz	
Inputs per Module:	16 individually isolated	8 (each input point has a separate common)	2 Module Replacement
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous 1500 VAC for one minute	
Input Current:	20 mA (typical) at rated voltage (reactive)	15 mA (typical) at rated voltage	
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current On response Time Off response Time	160 to 264 volts AC, 60 Hz Sinusoidal 0 to 40 volts AC, 60 Hz Sinusoidal 10 mA to 15 mA 0 to 5 mA (2.2 minimum at 40 V input) 20 ms typical	148 to 264 volts AC 0 to 40 volts AC 6 mA minimum 2.2 mA maximum 30 ms typical 45 ms typical	
Power Consumption: 5V	0.25 amps	60 mA (all inputs on) from 5 volt bus on backplane	
VME	System designed to support the VME standard C.1		

3.8.3 Pin Mapping

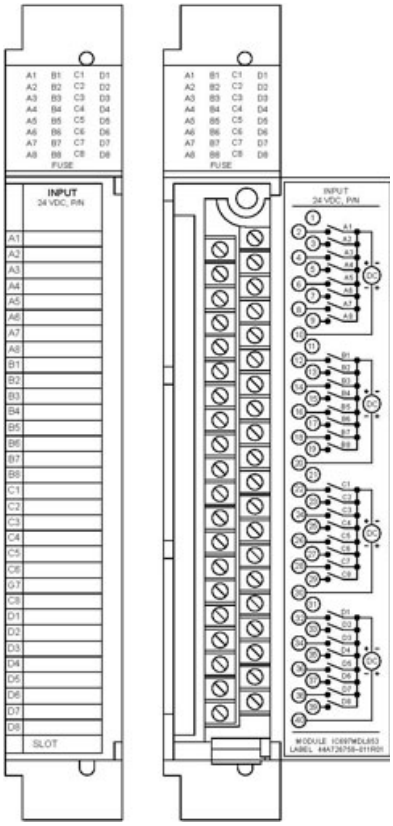
IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL241		IC694MDL231		IC694MDL231	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	N	3	N		
4	A2	4	I2		
5	N	5	N		
6	A3	6	I3		
7	N	7	N		
8	A4	8	I4		
9	N	9	N		
10	NC				
11	NC				
12	B1	12	I5		
13	N	13	N		
14	B2	14	I6		
15	N	15	N		
16	B3	16	I7		
17	N	17	N		
18	B4	18	I8		
19	N	19	N		
20	NC				
21	NC				
22	C1			2	I1
23	N			3	N
24	C2			4	I2
25	N			5	N
26	C3			6	I3
27	N			7	N
28	C4			8	I4
29	N			9	N
30	NC				
31	NC				
32	D1			12	I5
33	N			13	N
34	D2			14	I6
35	N			15	N
36	D3			16	I7
37	N			17	N
38	D4			18	I8
39	N			19	N
40	NC				

3.9 IC695CRH008 – 90-70 MDL653 to RX3i MDL660 Harness Assembly

3.9.1 Discrete Input Modules

24 VDC, Pos/Neg, 32Pt,

IC697MDL653



The 24 Volt DC Positive/Negative Logic Input Module provides 32 input points in four isolated groups of eight points each. The input current- voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.

24VDC, 32Pt, Grouped

IC694MDL660

The 24 VDC Positive/Negative Logic Input module, IC694MDL660, provides 32 discrete input points. The inputs are positive or negative logic inputs and will operate at levels up to 30V.

The inputs are arranged in four isolated groups of eight; each group has its own common. Isolation is provided between the four groups of inputs; however each group of eight inputs is referenced to the same user common connection.

3.9.2 Specification Comparison

Specification	IC697MDL653	IC694MDL660	Notes
Rated Voltage:	24 volts DC	24 volts DC	
Inputs per Module:	32 (four groups of eight inputs each)	32 (four isolated groups of 8 inputs)	
Input Filter Times		0.5ms, 1.0ms, 2.0ms, 5ms, 10ms, 50ms and 100ms, selectable per module	
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	10 mA (typical) at rated voltage (reactive)	7.0 mA per point (typical) at rated voltage	
Input Impedance:	2.6K ohm, typical		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	13.5 volts to 30 volts 0 volts to 5 volts 6 mA to 15 mA 0 to 2mA (2mA minimum at 5V input) 1mS or 10mS configurable	11.5 to 30 VDC 0 to 5 VDC 3.2mA minimum 1.1mA maximum 0.5ms, 1.0ms, 2.0ms, 5.0ms, 10.0ms, 50.0ms & 100.0ms (as per filter setting)	
Power Consumption:5V	0.3 amps	300mA with all inputs on	
VME	System designed to support the VME standard C.1		

3.9.3 Pin Mapping

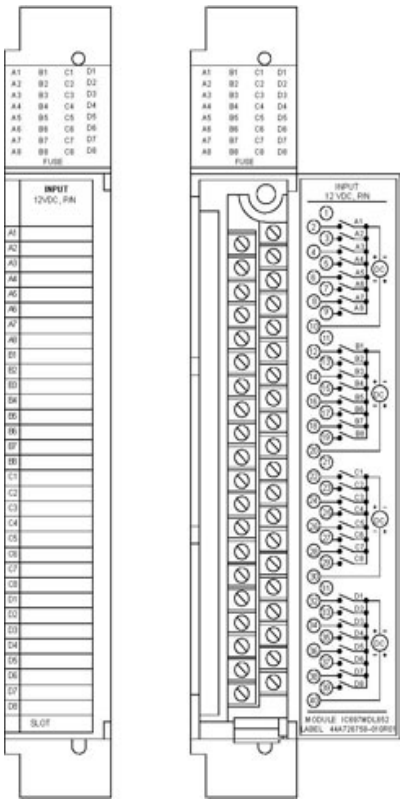
IC695ACC651		RX3i Module1	
IC697MDL653		IC694MDL660	
Terminals		Terminals (TB1)	
1	NC		
2	A1	1	I1
3	A2	2	I2
4	A3	3	I3
5	A4	4	I4
6	A5	5	I5
7	A6	6	I6
8	A7	7	I7
9	A8	8	I8
10	N	9	COM
11	NC		
12	B1	10	I9
13	B2	11	I10
14	B3	12	I11
15	B4	13	I12
16	B5	14	I13
17	B6	15	I14
18	B7	16	I15
19	B8	17	I16
20	N	18	COM
21	NC		
22	C1	19	I1
23	C2	20	I2
24	C3	21	I3
25	C4	22	I4
26	C5	23	I5
27	C6	24	I6
28	C7	25	I7
29	C8	26	I8
30	N	27	COM
31	NC		
32	D1	28	I9
33	D2	29	I10
34	D3	30	I11
35	D4	31	I12
36	D5	32	I13
37	D6	33	I14
38	D7	34	I15
39	D8	35	I16
40	N	36	COM

3.10 IC695CRH009 – 90-70 MDL652 to RX3i MDL654 Harness Assembly

3.10.1 Discrete Input Modules

12 VDC, Pos/Neg, 32Pt,

IC697MDL652



The 12 Volt DC Positive/Negative Logic Input Module provides 32 input points in four isolated groups of eight points each. The input current- voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.

5/12VDC, Pos/Neg, 32Pt,

IC694MDL654

The 5/12VDC (TTL) 32 Point Positive/Negative Logic Input module, IC694MDL654 provides 32 discrete TTL voltage threshold input points. The inputs are arranged in four isolated groups of eight. Each group has its own common. The inputs are positive or negative logic inputs that operate at levels up to 15V.

A single, regulated +5V supply is available through the I/O connectors on the front of the module. Its power input comes from the +5V logic supply on the PLC backplane. By installing jumpers on the I/O connector, you can choose to power the inputs from this internal supply instead of powering them with an external user provided supply.

3.10.2 Specification Comparison

Specification	IC697MDL652	IC694MDL654	Notes
Rated Voltage:	12 VDC, 47 to 63 Hz Sinusoidal	5 to 12 volts DC, Pos or Neg Logic	
Inputs per Module:	32 (four groups of eight inputs each)	32 (four groups of eight inputs each)	2 - IC693CBxxxx cables
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	10 mA (typical) at rated voltage	3.0mA (typical ON current @ 5VDC) 8.5mA (typical ON current @ 12VDC)	
Input Impedance:	1.12K ohms typical		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	7.5 to 15 volts RMS, 47 to 63 Hz Sinusoidal 0 to 2.5 volts RMS, 47 to 63 Hz Sinusoidal 6 mA to 15 mA 0 to 2.5mA (2mA min at 2.5V input) 20 ms typical	4.2 to 15 volts DC 0 to 2.6 volts DC 2.5mA (minimum) 1.2mA (maximum) 1ms maximum 1ms maximum	
Power Consumption: 5V	0.3 amps	+5 volts DC ±5%	
VME	System designed to support the VME standard C.1		

3.10.3 Pin Mapping

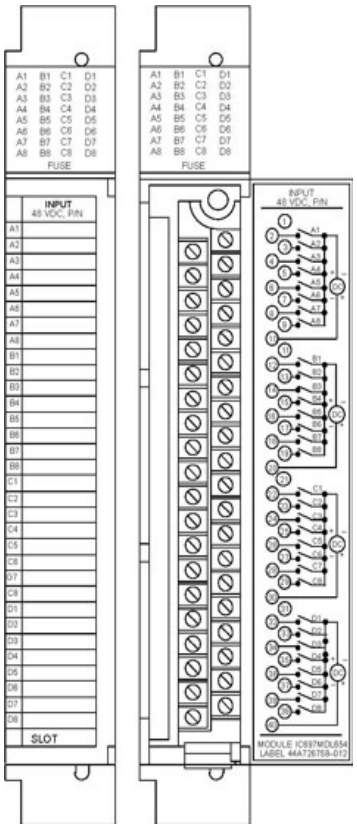
IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL654		IC694MDL654		IC694MDL654	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	NC			A6	NC
2	A1			A1	I1
3	A2			B1	I2
4	A3			A2	I3
5	A4			B2	I4
6	A5			A3	I5
7	A6			B3	I6
8	A7			A4	I7
9	A8			B4	I8
10	N			A5	N
11	NC			B7	NC
12	B1			B12	I9
13	B2			A12	I10
14	B3			B11	I11
15	B4			A11	I12
16	B5			B10	I13
17	B6			A10	I14
18	B7			B9	I15
19	B8			A9	I16
20	N			B8	N
21	NC	A6	NC		
22	C1	A1	I17		
23	C2	B1	I18		
24	C3	A2	I19		
25	C4	B2	I20		
26	C5	A3	I21		
27	C6	B3	I22		
28	C7	A4	I23		
29	C8	B4	I24		
30	N	A5	N		
31	NC	B7	NC		
32	D1	B12	I25		
33	D2	A12	I26		
34	D3	B11	I27		
35	D4	A11	I28		
36	D5	B10	I29		
37	D6	A10	I30		
38	D7	B9	I31		
39	D8	A9	I32		
40	N	B8	N		

3.11 IC695CRH010 – 90-70 MDL654 to RX3i MDL658 Harness Assembly

3.11.1 Discrete Input Modules

48 VDC, Pos/Neg, 32Pt,

IC697MDL654



The 48 Volt DC Pos/Neg Input Module provides 32 input points in four isolated groups of eight points each. The input current-voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.

48VDC, Pos/Neg, 32Pt,

IC694MDL658

PACSystems RX3i 32-Point Positive/Negative Logic input modules provide 32 positive or negative logic input points in four isolated groups of eight. Each group is referenced to its own common connection.

The 48VDC 32 Point Positive/Negative Logic Input module, IC694MDL658, provides 32 discrete input points that operate at levels up to 60V. Power to operate field devices must be provided using an external supply.

3.11.2 Specification Comparison

Specification	IC697MDL654	IC694MDL658	Notes
Rated Voltage:	48 volts DC	48 volts DC	
Inputs per Module:	32 (four groups of eight inputs each)	32 (four groups of eight inputs each)	2 - IC693CBxxxx cables
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	4.7mA (typical) at rated voltage	1.7mA @ 48 VDC	**Customer validation required:** If the input current requirement >1.7mA, this is not a recommended solution.
Input Impedance:	10.3K ohm, typical		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current Filter Delay Time:	33 volts to 56 volts 0 volts to 10 volts 3mA to 7mA 0 to 2mA (2mA minimum at 5V input) 1 ms or 10 ms configurable	34 to 60 volts DC 0 to 10 volts DC ≥ 1.0 mA (minimum) ≤0.4 mA (maximum) 2 ms maximum	
Power Consumption: 5V	0.3 amps	+5 volts DC ±5%	
VME	System designed to support the VME standard C.1		

3.11.3 Pin Mapping

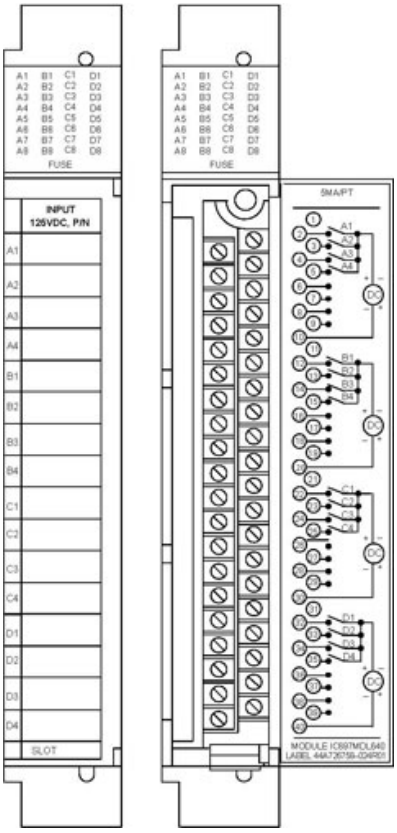
IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL654		IC694MDL658		IC694MDL658	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	NC			A6	NC
2	A1			A1	I1
3	A2			B1	I2
4	A3			A2	I3
5	A4			B2	I4
6	A5			A3	I5
7	A6			B3	I6
8	A7			A4	I7
9	A8			B4	I8
10	N			A5	N
11	NC			B7	NC
12	B1			B12	I9
13	B2			A12	I10
14	B3			B11	I11
15	B4			A11	I12
16	B5			B10	I13
17	B6			A10	I14
18	B7			B9	I15
19	B8			A9	I16
20	N			B8	N
21	NC	A6	NC		
22	C1	A1	I17		
23	C2	B1	I18		
24	C3	A2	I19		
25	C4	B2	I20		
26	C5	A3	I21		
27	C6	B3	I22		
28	C7	A4	I23		
29	C8	B4	I24		
30	N	A5	N		
31	NC	B7	NC		
32	D1	B12	I25		
33	D2	A12	I26		
34	D3	B11	I27		
35	D4	A11	I28		
36	D5	B10	I29		
37	D6	A10	I30		
38	D7	B9	I31		
39	D8	A9	I32		
40	N	B8	N		

3.12 IC695CRH011 – 90-70 MDL640 to RX3i MDL632 Harness Assembly

3.12.1 Discrete Input Modules

125 VDC, Pos/Neg, 16Pt,

IC697MDL640



The 125 Volt DC Positive/Negative Input Module provides 16 input points in four isolated groups of four points each. The input current-voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are included at the top of the module.

The module is mechanically keyed to ensure correct replacement with a similar type in the field. I/O references are user configurable without the use of jumpers or DIP switches on the module.

125VDC, Pos/Neg, 8Pt,

IC694MDL632

The 125 volt DC Positive/Negative Logic Input module, IC694MDL632, provides 8 input points in two isolated groups with four points in each group.

Each group has a separate common (the two commons are not tied together inside the module). Each group can be wired for either positive or negative logic. Current into an input point results in a logic 1 in the input status table (%I). Input characteristics are compatible with a wide range of input devices, such as pushbuttons, limit switches, and electronic proximity switches. Power to operate field devices must be supplied by the user.

3.12.2 Specification Comparison

Specification	IC697MDL640	IC694MDL632	Notes
Rated Voltage:	125 volts DC	125 volts DC (Pos or Neg Logic)	
Inputs per Module:	16 (four groups of four inputs each)	8 (two groups of four inputs)	2 Module Replacement
Isolation:	1500 volts RMS any input to backplane 500 volts RMS between input groups	250 VAC continuous 1500 VAC for one minute	
Input Current:	5mA (typical) at rated voltage	4.5 mA typical	
Input Impedance:	24.5K ohm, typical		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current On response Time Off response Time Filter Delay Time:	Positive: 90 volts to 145 volts Negative: –20 volts to V_s –90 volts Positive: –35 volts to +35 volts Negative: V_s –35 volts to 56 volts 3mA to 7mA 0 to 40 volts AC, 60 Hz Sinusoidal 10 mA to 15 mA 0 to 2mA (2mA minimum at 125V input) 1 ms or 10 ms configurable	90 to 150 volts DC 0 to 30 volts DC 3.1 mA 1.1 mA maximum 7 ms typical 7 ms typical	Customer Validation required: The RX3i module must be used in accordance with the RX3i specifications.
Power Consumption: 5V	0.30 amps	40mA from the 5 volt bus on the backplane 36mA (typical) from user input supply (all inputs ON)	
VME	System designed to support the VME standard C.1		

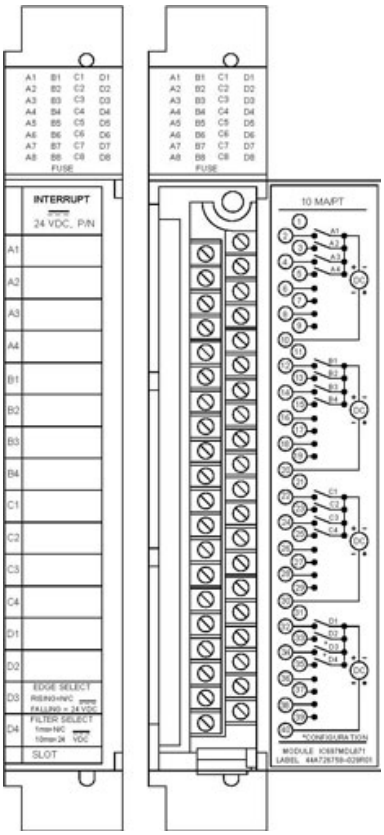
3.12.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL640		IC694MDL632		IC694MDL632	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	NC				
2	A1	2	I1		
3	A2	4	I2		
4	A3	6	I3		
5	A4	8	I4		
6	NC				
7	NC				
8	NC				
9	NC				
10	COM	10	COM		
11	NC				
12	B1	12	I5		
13	B2	14	I6		
14	B3	16	I7		
15	B4	18	I8		
16	NC				
17	NC				
18	NC				
19	NC				
20	COM	20	COM		
21	NC				
22	C1			2	I1
23	C2			4	I2
24	C3			6	I3
25	C4			8	I4
26	NC				
27	NC				
28	NC				
29	NC				
30	COM			10	COM
31	NC				
32	D1			12	I5
33	D2			14	I6
34	D3			16	I7
35	D4			18	I8
36	NC				
37	NC				
38	NC				
39	NC				
40	COM			20	COM

3.13 IC695CRH013 – 90-70 MDL671 to RX3i MDL645 Harness Assembly

3.13.1 Discrete Input Modules

24 VDC, Pos/Neg, 14Pt, IC697MDL671



The 24 Volt DC Positive/Negative Logic Interrupt Input Module provides 16 points total in four isolated groups of four points each. The first 14 points (A1 through D2) are interrupt inputs and the last 2, D3 and D4 are configuration inputs. The input current- voltage characteristics meet IEC standard (type 1) specifications.

LED indicators which give the ON-OFF status of each point are located at the top of the module.

24VDC, Pos/Neg, 14Pt, IC694MDL645

The 24 volt DC Positive/Negative Logic Input module, IC694MDL645, provides 16 input points in one group with a common power input terminal. This input module can be wired for either positive logic or negative logic. Input characteristics are compatible with a wide range of input devices, such as pushbuttons, limit switches, and electronic proximity switches. Current into an input point results in a logic 1 in the input status table (%I). Field devices can be powered from an external supply. Depending on their requirements, some input devices can be powered from the module's +24V OUT and 0V OUT terminals.

3.13.2 Specification Comparison

Specification	IC697MDL671	IC694MDL645	Notes
Rated Voltage:	24 volts DC	24 volts DC	
Input Voltage Range	–3 to +30 volts DC	0 to +30 volts DC	
Inputs per Module:	14 interrupts (total of 16 inputs with four groups of four inputs each)	16 (one group with a single common)	**Customer Validation Required:** -IC694MDL645 does not support interrupts. -Out of 16 inputs, IC697MDL671 supports with four groups of four inputs each, whereas RX3i module supports one group of 16 inputs with single common, this will affect group to group isolation in case of RX3i module.
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Input Current:	10mA (typical) at rated voltage	7mA (typical) at rated voltage	
Input Impedance:	2.6K ohm, typical		
Input Characteristics			
On-state Voltage: Off-state Voltage: On-state Current: Off-state Current On response Time Off response Time	Positive: 13.5 volts to 30 volts Negative: –3 volts to Vs –13.5 volts Positive: –3 volts to 5 volts Negative: Vs –5 volts to 30 volts 1.7mA (typical) at rated voltage 6mA to 15mA 0 to 2mA (2mA minimum at 5V input) 1 ms or 10 ms configurable	11.5 to 30 volts DC 0 to +5 volts DC 3.2 mA (minimum) 1.1 mA (maximum) 7 ms maximum 7 ms maximum	**Customer Validation required:** The RX3i module must be used in accordance with the RX3i specifications
Power Consumption: 5V	.53 amp	80mA (all inputs on) from 5 volt bus on backplane	
Power Consumption: 24V		125mA from the Isolated 24 volt backplane bus or from user supplied power	
VME	System designed to support the VME standard C.1		

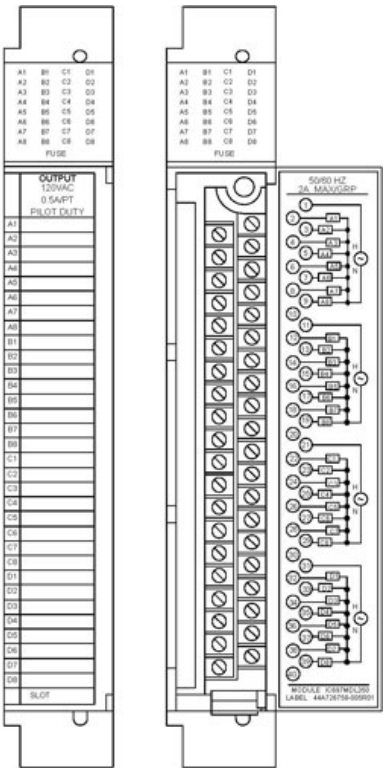
3.13.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL671		IC694MDL645	
Terminals		Terminals (TB1)	
1	NC		
2	A1	2	I1
3	A2	3	I2
4	A3	4	I3
5	A4	5	I4
6	NC		
7	NC		
8	NC		
9	NC		
10	COM	1	COM
11	NC		
12	B1	6	I5
13	B2	7	I6
14	B3	8	I7
15	B4	9	I8
16	NC		
17	NC		
18	NC		
19	NC		
20	COM	1	COM
21	NC		
22	C1	10	I9
23	C2	11	I10
24	C3	12	I11
25	C4	13	I12
26	NC		
27	NC		
28	NC		
29	NC		
30	COM	1	COM
31	NC		
32	D1	14	I13
33	D2	15	I14
34	D3	16	I15
35	D4	17	I16
36	NC		
37	NC		
38	NC		
39	NC		
40	COM	1	COM

3.14 IC695CRH014 – 90-70 MDL350 to RX3i MDL340 Harness Assembly

3.14.1 Discrete Output Modules

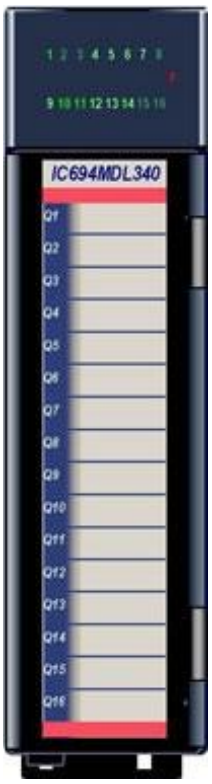
120 VAC, 0.5A, 32Pt, IC697MDL350



The 120 Volt AC 0.5 Amp Output Module provides 32 output points in four isolated groups of 8 points each. This allows each group of 8 points to be used on a different phase of the AC supply. Each group of 8 outputs is individually fused with a 5 amp fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will pick up most size 2 contactors.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuits as well as an LED to indicate the status of the fuses are located together at the top of the module.

120VAC, 0.5A, 16Pt, IC694MDL340



The 120 volt, 0.5 Amp AC Output module, IC694MDL340, provides 16 output points in two isolated groups of eight points. Each group has a separate common. The two commons are not tied together inside the module. The groups can be used on different phases of the AC supply or powered from the same supply. Each group is protected with a 3 Amp fuse. An RC snubber protects each output against transient electrical noise on the power line.

This module provides a high degree of inrush current; so the outputs can control a wide range of inductive and incandescent loads. AC Power to operate loads connected to outputs must be supplied by the user. This module requires an AC power source.

3.14.2 Specification Comparison

Specification	IC697MDL350	IC694MDL340	Notes
Rated Voltage:	120 volts AC	120 volts AC	
Output Voltage Range	85 to 132 volt, 47-63 Hz	85 to 132 volts AC, 50/60 Hz	
Outputs per Module:	32 (four groups of 8 outputs each)	16 (two groups of eight outputs each)	2 Module Replacement
Isolation:	1500 volts - any output to backplane 500 volts between groups	250 VAC continuous 1500 VAC for one minute	
Output Current:	0.5 amps maximum per point 2 amps maximum per group	0.5 amp maximum per point 3 amps maximum per group	
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On Response Time Off Response Time Output Leakage	10 amps max per point for one cycle 3 volts maximum 1 ms maximum 1/2 cycle 1.5 mA maximum	20 amps maximum for one cycle 50 mA 1.5 volts maximum 1 ms maximum 1/2 cycle maximum 2 mA maximum at 120 VAC	
Power Consumption: 5V	0.5 amp	315 mA (all outputs ON) from 5 volt bus on backplane	
VME	System designed to support the VME standard C.1		

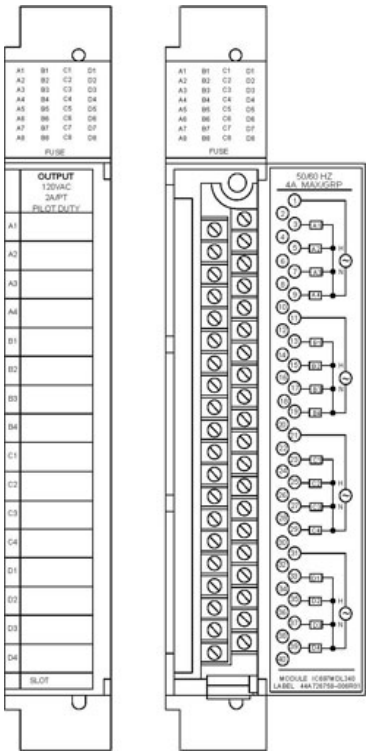
3.14.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL350		IC694MDL340		IC694MDL340	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	COM	9	COM		
2	A1	1	Q1		
3	A2	2	Q2		
4	A3	3	Q3		
5	A4	4	Q4		
6	A5	5	Q5		
7	A6	6	Q6		
8	A7	7	Q7		
9	A8	8	Q8		
10	NC				
11	COM	19	COM		
12	B1	11	Q9		
13	B2	12	Q10		
14	B3	13	Q11		
15	B4	14	Q12		
16	B5	15	Q13		
17	B6	16	Q14		
18	B7	17	Q15		
19	B8	18	Q16		
20	NC				
21	COM			9	COM
22	C1			1	Q1
23	C2			2	Q2
24	C3			3	Q3
25	C4			4	Q4
26	C5			5	Q5
27	C6			6	Q6
28	C7			7	Q7
29	C8			8	Q8
30	NC				
31	COM			19	COM
32	D1			11	Q9
33	D2			12	Q10
34	D3			13	Q11
35	D4			14	Q12
36	D5			15	Q13
37	D6			16	Q14
38	D7			17	Q15
39	D8			18	Q16
40	NC				

3.15 IC695CRH015 – 90-70 MDL340 to RX3i MDL330 Harness Assembly

3.15.1 Discrete Output Modules

120 VAC, 2A, 16Pt, IC697MDL340



The 120 Volt AC 2 Amp Output Module provides 16 output points in four isolated groups of four points each. This allows each group of four points to be used on different phases of the AC supply. Each group of four outputs is individually fused with a 10 amp fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will pick up most size 4 contactors.

LED indicators which give the ON/OFF status of each point on the logic(PLC) side of the circuit as well as an LED to indicate the status of the fuses are located together at the top of the module.

120/240VAC, Isolated, 2A, 8Pt, IC694MDL330

The 120/240 volt, 2 Amp AC Output module, IC694MDL330, provides eight output points in two isolated groups of four points. Each group has a separate common. The two commons are not tied together inside the module. The groups can be used on different phases of the AC supply or powered from the same supply. AC power to operate loads connected to outputs must be user supplied.

This module requires an AC power source; it cannot be used with a DC power source

3.15.2 Specification Comparison

Specification	IC697MDL340	IC694MDL330	Notes
Rated Voltage:	120 volts AC	120/240 volts AC	
Output Voltage Range	85 to 132 volt, 47-63 Hz	85 to 264 volts AC, 50/60 Hz	
Outputs per Module:	16 (four groups of four outputs each)	8 (two groups of four outputs each)	2 Module Replacement
Isolation:	1500 volts - any output to backplane 500 volts between groups	250 VAC continuous 1500 VAC for one minute	
Output Current:	2 amps maximum per point 4 amps maximum per group	2 amp maximum per point 4 amps maximum per group	
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On response Time Off response Time Output Leakage	20 amps max per point for one cycle 3 volts maximum 1 ms maximum 1/2 cycle 1.5 mA maximum	20 amps maximum for one cycle 100 mA 1.5 volts maximum 1 ms maximum 1/2 cycle maximum 3 mA maximum at 120VAC 6 mA maximum at 240 VAC	
Power Consumption: 5V	0.25 amp	160 mA (all outputs on) from 5 volt bus on backplane	
VME	System designed to support the VME standard C.1		

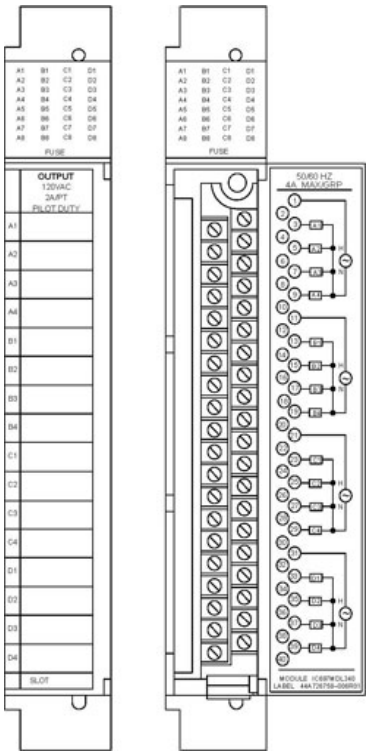
3.15.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL340		IC694MDL330		IC694MDL330	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	COM	10	COM		
2	NC				
3	A1	2	Q1		
4	NC				
5	A2	4	Q2		
6	NC				
7	A3	6	Q3		
8	NC				
9	A4	8	Q4		
10	NC				
11	COM	20	COM		
12	NC				
13	B1	12	Q5		
14	NC				
15	B2	14	Q6		
16	NC				
17	B3	16	Q7		
18	NC				
19	B4	18	Q7		
20	NC				
21	COM			10	COM
22	NC				
23	C1			2	Q1
24	NC				
25	C2			4	Q2
26	NC				
27	C3			6	Q3
28	NC				
29	C4			8	Q4
30	NC				
31	COM			20	COM
32	NC				
33	D1			12	Q5
34	NC				
35	D2			14	Q6
36	NC				
37	D3			16	Q7
38	NC				
39	D4			18	Q8
40	NC				

3.16 IC695CRH016 – 90-70 MDL340 to RX3i MDL350 Harness Assembly

3.16.1 Discrete Output Modules

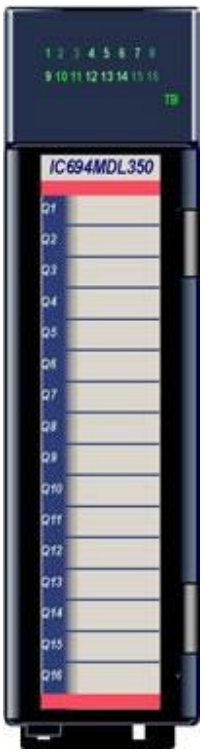
120 VAC, 2A, 16Pt, IC697MDL340



The 120 Volt AC 2 Amp Output Module provides 16 output points in four isolated groups of four points each. This allows each group of four points to be used on different phases of the AC supply. Each group of four outputs is individually fused with a 10 amp fuse. The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will pick up most size 4 contactors.

LED indicators which give the ON/OFF status of each point on the logic (PLC) side of the circuit as well as an LED to indicate the status of the fuses are located together at the top of the module.

120/240VAC, Isolated, 2A, 16Pt, IC694MDL350



The 120/240VAC 16-Point Isolated Output module, IC694MDL350, provides 16 individually-isolated output points. A high level of noise immunity minimizes the need for external snubbers to protect the outputs against transient electrical noise on the power line. The outputs can control a wide range of inductive and incandescent loads. Power to operate the output loads must be provided with an external AC power supply.

A DIP switch on back of the module is used to select the outputs' default mode: Force Off or Hold Last State. The module must be removed from the backplane to set this switch.

3.16.2 Specification Comparison

Specification	IC697MDL340	IC694MDL350	Notes
Rated Voltage:	120 volts AC	120/240 volts AC	
Output Voltage Range	85 to 132 volt, 47-63 Hz	74 – 265VAC (47 to 63 Hz), 120/240VAC nominal	
Outputs per Module:	16 (four groups of four outputs each)	16 isolated	**Customer validation required:** Customer must verify for this spec before using IC694MDL350.
Isolation:	1500 volts - any output to backplane 500 volts between groups	250 VAC continuous; 1500 VAC for one minute	
Output Current:	2 amps maximum per point 4 amps maximum per group	Per Point 2A max. @ 30°C, 1A max. @ 60°C Per Module 5A max. @ 30°C, 4A max. @ 60°C	Output fusing must be added for each output to replace the 3.15 amp internal output fuse.
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On response Time Off response Time Output Leakage	20 amps max per point for one cycle 3 volts maximum 1 ms maximum 1/2 cycle 1.5 mA maximum	20 Amps maximum for one cycle 10 mA per point 1.5 volts maximum 1/2 cycle maximum 1/2 cycle maximum 2 mA maximum	
Power Consumption: 5V	0.25 amp	315 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

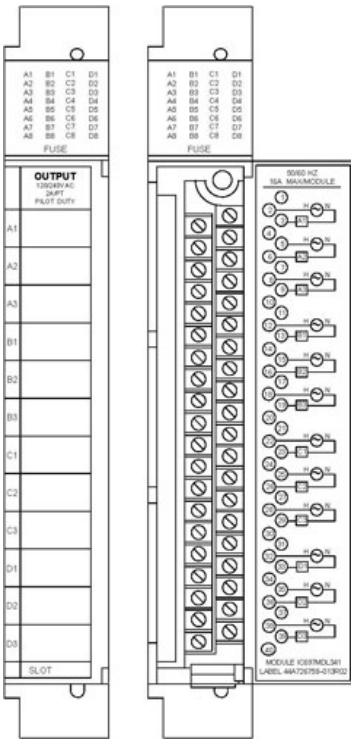
3.16.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL340		IC694MDL350	
Terminals		Terminals (TB1)	
1	COM	2, 4 6, 8	H
2	NC		
3	A1	1	Q1
4	NC		
5	A2	3	Q2
6	NC		
7	A3	5	Q3
8	NC		
9	A4	7	Q4
10	NC		
11	COM	10, 12 14, 16	H
12	NC		
13	B1	9	Q5
14	NC		
15	B2	11	Q6
16	NC		
17	B3	13	Q7
18	NC		
19	B4	15	Q8
20	NC		
21	COM	20, 22 24, 26	H
22	NC		
23	C1	19	Q9
24	NC		
25	C2	21	Q10
26	NC		
27	C3	23	Q11
28	NC		
29	C4	25	Q12
30	NC		
31	COM	28, 30 32, 34	H
32	NC		
33	D1	27	Q13
34	NC		
35	D2	29	Q14
36	NC		
37	D3	31	Q15
38	NC		
39	D4	33	Q16
40	NC		

3.17 IC695CRH017 – 90-70 MDL341 to RX3i MDL350 Harness Assembly

3.17.1 Discrete Output Modules

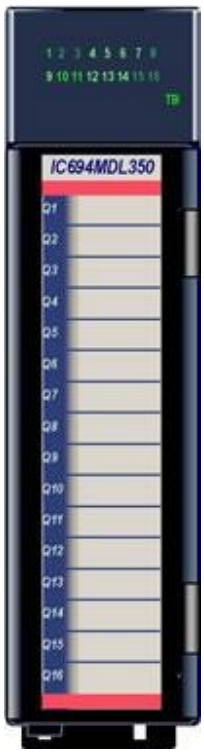
120/240 VAC, Isolated, 2A, 12Pt, IC697MDL341



The 120/240 Volt AC 2 Amp Isolated Output Module for use with a Programmable Logic Controller (PLC) provides 12 isolated output points. This allows each point to be used on different phases of the AC supply. Each output point is individually fused with a 3.15 amp replaceable fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will operate most size 4 contactors.

120/240VAC, Isolated, 2A, 16Pt, IC694MDL350



The 120/240VAC 16-Point Isolated Output module, IC694MDL350, provides 16 individually-isolated output points. A high level of noise immunity minimizes the need for external snubbers to protect the outputs against transient electrical noise on the power line. The outputs can control a wide range of inductive and incandescent loads. Power to operate the output loads must be provided with an external AC power supply.

A DIP switch on back of the module is used to select the outputs' default mode: Force Off or Hold Last State. The module must be removed from the backplane to set this switch.

3.17.2 Specification Comparison

Specification	IC697MDL341	IC694MDL350	Notes
Rated Voltage:	120/240 volts AC	120/240 volts AC	
Output Voltage Range	85 to 264 volts AC, 47-63 Hz	74 – 265VAC (47 to 63 Hz), 120/240VAC nominal	
Outputs per Module:	12 individually isolated	16 isolated	
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Output Current:	2 amps maximum per point 16 amps maximum per module	Per Point 2A max. @ 30°C, 1A max. @ 60°C Per Module 5A max. @ 30°C, 4A max. @ 60°C	Output fusing must be added for each output to replace the 3.15 amp internal output fuse.
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On response Time Off response Time Output Leakage	20 amps maximum for one cycle 1.5 volts maximum 1 ms maximum 1/2 cycle maximum 3 mA maximum at 120 volts AC 6 mA maximum at 240 volts AC	20 Amps maximum for one cycle 10 mA per point 1.5 volts maximum 1/2 cycle maximum 1/2 cycle maximum 2 mA maximum	
Power Consumption: 5V	.25 amp	315 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

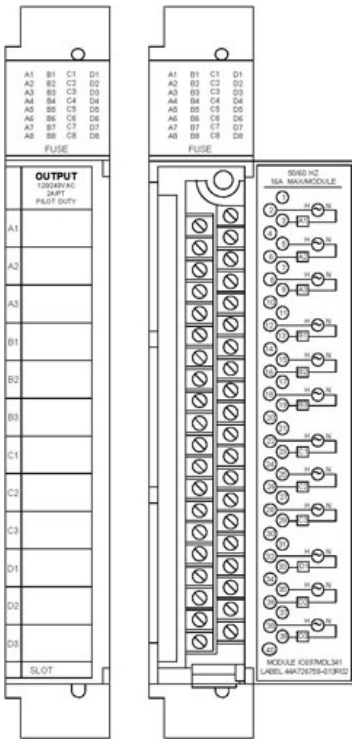
3.17.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL341		IC694MDL350	
Terminals		Terminals (TB1)	
1	NC		
2	H	2	H
3	A1	1	Q1
4	NC		
5	H	4	H
6	A2	3	Q2
7	NC		
8	H	6	H
9	A3	5	Q3
10	NC		
11	NC		
12	H	8	H
13	B1	7	Q4
14	NC		
15	H	10	H
16	B2	9	Q5
17	NC		
18	H	12	H
19	B3	1	Q6
20	NC		
21	NC		
22	H	14	H
23	C1	13	Q7
24	NC		
25	H	16	H
26	C2	15	Q8
27	NC		
28	H	20	H
29	C3	19	Q9
30	NC		
31	NC		
32	H	22	H
33	D1	21	Q10
34	NC		
35	H	24	H
36	D2	23	Q11
37	NC		
38	H	26	H
39	D3	25	Q12
40	NC		

3.18 IC695CRH018 – 90-70 MDL341 to RX3i MDL390 Harness Assembly

3.18.1 Discrete Output Modules

120/240 VAC, Isolated, 2A, 12Pt, IC697MDL341



The 120/240 Volt AC 2 Amp Isolated Output Module for use with a Programmable Logic Controller (PLC) provides 12 isolated output points. This allows each point to be used on different phases of the AC supply. Each output point is individually fused with a 3.15 amp replaceable fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will operate most size 4 contactors.

120/240VAC, Isolated, 2A, 5Pt, IC694MDL390

The 120/240 volt, 2 Amp Isolated AC Output module, IC694MDL390, provides five isolated output points, each with a separate common. Each output circuit is isolated from the others relative to the AC power source. The commons are not tied together inside the module. The output circuits can be used on different phases of the AC supply or powered from the same supply. AC Power to operate the loads connected to the outputs must be supplied by the user. This module requires an AC power source; it cannot be used with a DC power source.

3.18.2 Specification Comparison

Specification	IC697MDL341	IC694MDL390	Notes
Rated Voltage:	120/240 volts AC	120/240 volts AC	
Output Voltage Range	85 to 264 volts AC, 47-63 Hz	85 to 264 volts AC, 50/60 Hz	
Outputs per Module:	12 individually isolated	5 (each output isolated from the others)	3 Module Replacement
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Output Current:	2 amps maximum per point 16 amps maximum per module	2 Amps maximum per point 5 Amps max per module at 45°C 2 Amps max per module at 60°C	
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On response Time Off response Time Output Leakage	20 amps maximum for one cycle 1.5 volts maximum 1 ms maximum 1/2 cycle maximum 3 mA maximum at 120 VAC 6 mA maximum at 240 VAC	25 Amps maximum for one cycle 100 mA 1.5 volts maximum 1 ms maximum 1/2 cycle maximum 3mA maximum at 120 VAC 6mA maximum at 240 VAC	
Power Consumption: 5V	.25 amp	110 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

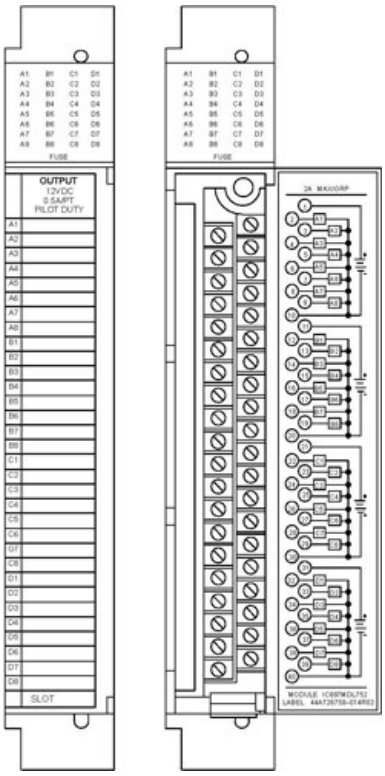
3.18.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3	
IC697MDL341		IC694MDL390		IC694MDL390		IC694MDL390	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)	
1	NC						
2	H	2	H				
3	A1	4	Q1				
4	NC						
5	H	6	H				
6	A2	8	Q2				
7	NC						
8	H	10	H				
9	A3	12	Q3				
10	NC						
11	NC						
12	H	14	H				
13	B1	16	Q4				
14	NC						
15	H	18	H				
16	B2	20	Q5				
17	NC						
18	H			2	H		
19	B3			4	Q1		
20	NC						
21	NC						
22	H			6	H		
23	C1			8	Q2		
24	NC						
25	H			10	H		
26	C2			12	Q3		
27	NC						
28	H			14	H		
29	C3			16	Q4		
30	NC						
31	NC						
32	H			18	H		
33	D1			20	Q5		
34	NC						
35	H					2	H
36	D2					4	Q1
37	NC						
38	H					6	H
39	D3					8	Q2
40	NC						

3.19 IC695CRH019 – 90-70 MDL752 to RX3i MDL753 Harness Assembly

3.19.1 Discrete Output Modules

12 VDC, 0.5A, 32Pt, IC697MDL752



The 12 Volt DC 0.5 Amp Output Module provides 32 output points in four isolated groups of 8 points each.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of loads which have such characteristics.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are located together at the top of the module.

12/24VDC, 0.5A, Pos Logic 32Pt, IC694MDL753

The 12/24 volt DC, 0.5A Positive Logic Output module, IC694MDL753, provides 32 discrete outputs in four isolated groups of eight. Each group has its own common. The outputs are positive logic or sourcing type outputs; they switch the loads on the positive side of the power supply, and supply current to the load. The outputs can switch user loads over the range of +12 to +24 VDC (+20%, - 15%) and can source a maximum current of 0.5 Amps per point. There are two pins on the I/O connectors for each group common. Each pin has a current handling capacity of 3 Amps.

3.19.2 Specification Comparison

Specification	IC697MDL752	IC694MDL753	Notes
Rated Voltage:	12 volts DC	12 through 24 volts DC, positive logic	
Output Voltage Range	10 to 15 volts	10.2 to 28.8 volts DC	
Outputs per Module:	32 (four groups of 8 outputs each)	32 (four groups of eight outputs each)	2 - IC693CBxxxx cables
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Output Current:	0.5 amps maximum per point 2 amps maximum per group	0.5 Amps per point with 4 Amps maximum per group and 3 Amps maximum per group common pin	
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On response Time Off response Time Output Leakage	10 amps maximum for 20 ms 1 volt (2 ohms) maximum 1 ms maximum 1 ms maximum 1 mA maximum	5.4 Amps for 10 ms 0.3 volt DC 0.5 ms maximum 0.5 ms maximum 0.1 mA maximum	**Customer validation required:** Customer must verify that the inrush current is not greater than 5.4mA before using IC694MDL753.
Power Consumption: 5V	0.25 amp	260 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

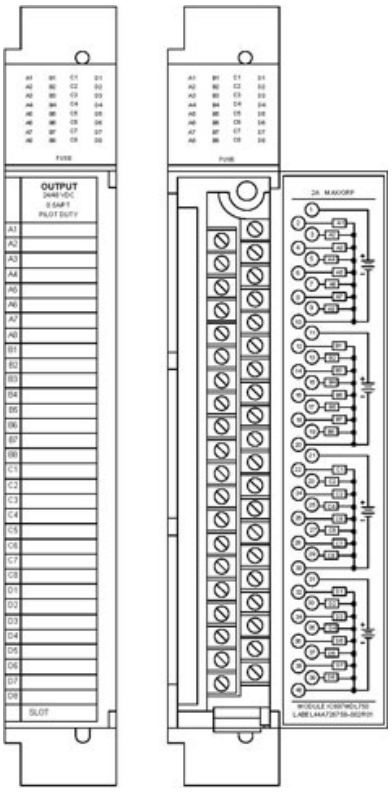
3.19.3 Pin Mapping

IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL752		IC694MDL753		IC694MDL753	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	(+)			A6	(+)
2	A1			A1	Q1
3	A2			B1	Q2
4	A3			A2	Q3
5	A4			B2	Q4
6	A5			A3	Q5
7	A6			B3	Q6
8	A7			A4	Q7
9	A8			B4	Q8
10	(-)			A5	(-)
11	(+)			B7	(+)
12	B1			B12	Q9
13	B2			A12	Q10
14	B3			B11	Q11
15	B4			A11	Q12
16	B5			B10	Q13
17	B6			A10	Q14
18	B7			B9	Q15
19	B8			A9	Q16
20	(-)			B8	(-)
21	(+)	A6	(+)		
22	C1	A1	Q17		
23	C2	B1	Q18		
24	C3	A2	Q19		
25	C4	B2	Q20		
26	C5	A3	Q21		
27	C6	B3	Q22		
28	C7	A4	Q23		
29	C8	B4	Q24		
30	(-)	A5	(-)		
31	(+)	B7	(+)		
32	D1	B12	Q25		
33	D2	A12	Q26		
34	D3	B11	Q27		
35	D4	A11	Q28		
36	D5	B10	Q29		
37	D6	A10	Q30		
38	D7	B9	Q31		
39	D8	A9	Q32		
40	(-)	B8	(-)		

3.20 IC695CRH020 – 90-70 MDL750 to RX3i MDL753 Harness Assembly

3.20.1 Discrete Output Modules

24/48 VDC, 0.5A, 32Pt, IC697MDL750



The 24/48 Volt DC 0.5 Amp Output Module for the Programmable Logic Controller (PLC) provides 32 output points in four isolated groups of 8 points each.

This output module provides a high degree of inrush current which makes the outputs suitable for a wide range of loads which have such characteristics.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit are located together at the top of the module.

12/24VDC, 0.5A, Pos Logic 32Pt, IC694MDL753

The 12/24 volt DC, 0.5A Positive Logic Output module, IC694MDL753, provides 32 discrete outputs in four isolated groups of eight. Each group has its own common. The outputs are positive logic or sourcing type outputs; they switch the loads on the positive side of the power supply, and supply current to the load. The outputs can switch user loads over the range of +12 to +24 VDC (+20%, - 15%) and can source a maximum current of 0.5 Amps per point. There are two pins on the I/O connectors for each group common. Each pin has a current handling capacity of 3 Amps.

3.20.2 Specification Comparison

Specification	IC697MDL750	IC694MDL753	Notes
Rated Voltage:	24 or 48 volts DC	12 through 24 volts DC, positive logic	
Output Voltage Range	20 to 60 volts	10.2 to 28.8 volts DC	
Outputs per Module:	32 (four groups of 8 outputs each)	32 (four groups of eight outputs each)	2 - IC693CBxxxx cables
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Output Current:	0.5 amps maximum per point 2 amps maximum per group	0.5 Amps per point with 4 Amps maximum per group and 3 Amps maximum per group common pin	
Output Characteristics			
Inrush Current Min Load Current Output Voltage Drop On response Time Off response Time Output Leakage	10 amps maximum for 20 ms 1 volt (2 ohms) maximum 1 ms maximum 1 ms maximum 1 mA maximum	5.4 Amps for 10 ms 0.3 volt DC 0.5 ms maximum 0.5 ms maximum 0.1 mA maximum	
Power Consumption: 5V	.25 amp	260 mA (with all outputs ON)	
VME	System designed to support the VME standard C.1		

3.20.3 Pin Mapping

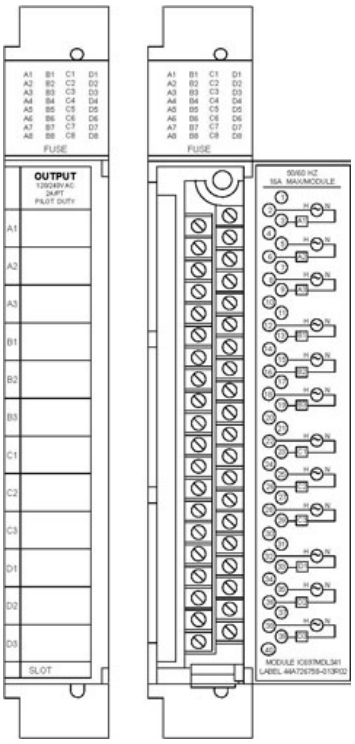
IC695ACC651		RX3i Module 1		RX3i Module 1	
IC697MDL750		IC694MDL753		IC694MDL753	
Terminals		Left Side Terminals(TB1)		Right Side Terminals(TB2)	
1	(+)			A6	(+)
2	A1			A1	Q1
3	A2			B1	Q2
4	A3			A2	Q3
5	A4			B2	Q4
6	A5			A3	Q5
7	A6			B3	Q6
8	A7			A4	Q7
9	A8			B4	Q8
10	(-)			A5	(-)
11	(+)			B7	(+)
12	B1			B12	Q9
13	B2			A12	Q10
14	B3			B11	Q11
15	B4			A11	Q12
16	B5			B10	Q13
17	B6			A10	Q14
18	B7			B9	Q15
19	B8			A9	Q16
20	(-)			B8	(-)
21	(+)	A6	(+)		
22	C1	A1	Q17		
23	C2	B1	Q18		
24	C3	A2	Q19		
25	C4	B2	Q20		
26	C5	A3	Q21		
27	C6	B3	Q22		
28	C7	A4	Q23		
29	C8	B4	Q24		
30	(-)	A5	(-)		
31	(+)	B7	(+)		
32	D1	B12	Q25		
33	D2	A12	Q26		
34	D3	B11	Q27		
35	D4	A11	Q28		
36	D5	B10	Q29		
37	D6	A10	Q30		
38	D7	B9	Q31		
39	D8	A9	Q32		
40	(-)	B8	(-)		

3.21 IC695CRH022 – 90-70 MDL940 to RX3i MDL916 Harness Assembly

3.21.1 Discrete Output Modules

Relay Output, 16Pt,

IC697MDL940

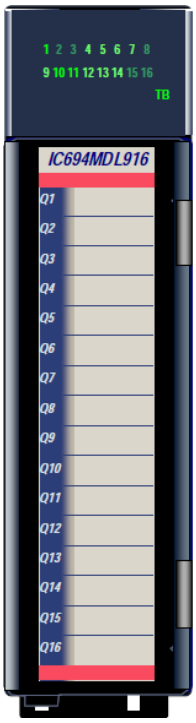


The 120/240 Volt AC 2 Amp Isolated Output Module for use with a Programmable Logic Controller (PLC) provides 12 isolated output points. This allows each point to be used on different phases of the AC supply. Each output point is individually fused with a 3.15 amp replaceable fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of inductive and incandescent loads. The module will operate most size 4 contactors.

Relay Output, 16Pt, 4A, Isolated

IC694MDL916



The 4 Amp 16 Point Relay Output module provides 16 Form A relays for controlling output loads. The maximum output switching capacity of each circuit is 4 Amps. Each output point is isolated from the other points, and each point has a separate common power output terminal. Outputs provide a high degree of noise immunity, minimizing the need to add external snubbers.

3.21.2 Specification Comparison

Specification	IC697MDL940	IC694MDL916	Notes
Rated Voltage:	120/240 VAC or 5/24/125 VDC	120 VDC/240 VAC	
Outputs per Module:	16 8 points - Form C (isolated) 8 points - Form A (2 groups of 4)	16 isolated Form A relay outputs	**Customer Validation required:** IC694MDL916 only supports Form A applications.
Isolation:	1500 volts - any output to backplane 500 volts between input groups	250 VAC continuous; 1500 VAC for one minute	
Output Current:	2.0 amps 5 to 265 VAC, 47-63 Hz 2.0 amps 5 to 30 VDC 0.2 amps 31 to 125 VDC 0.2 amps 31 to 150 VDC Form A only	10mA per point minimum 4A for 5-250VAC maximum (resistive or general purpose) 4A for 5-30VDC maximum (resistive) 200mA for 125VDC (maximum resistive) 2A pilot duty per output (5 to 30VDC, 5 to 250VAC)	
Output Characteristics			
Min. Load Current Output Leakage Response Time ON Response Time OFF Switching Frequency	10mA 1 mA at 120VAC 10 msec (maximum) 10 msec (maximum) 20 cycles/minute (inductive load)	10mA Not Applicable (open contact) 10ms maximum 10ms maximum 20 cycles per minute maximum	
Power Consumption: 5V	.75 A	0.3 A	
VME	System designed to support the VME standard C.1		

3.21.3 Pin Mapping

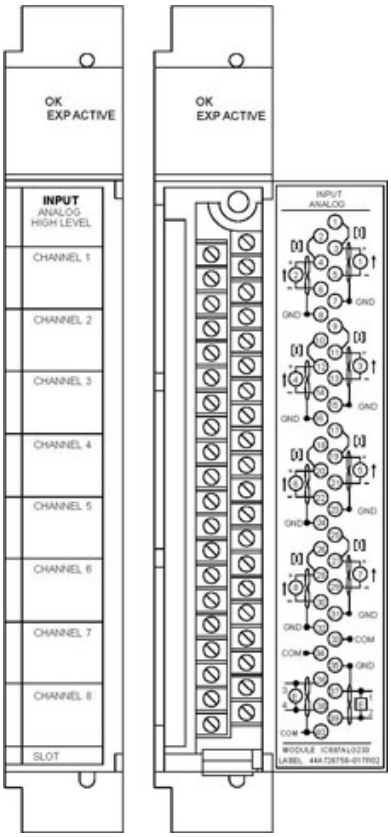
IC695ACC651		RX3i Module1	
IC697MDL940		IC694MDL916	
Terminals		Terminals (TB1)	
1	A1 NO	1	NO
2	(+)	2	RTN
3	A1 NC		
4	A2 NO	3	NO
5	(+)	4	RTN
6	A2 NC		
7	A3 NO	5	NO
8	(+)	6	RTN
9	A3 NC		
10	A4 NO	7	NO
11	(+)	8	RTN
12	A4 NC		
13	NC		
14	B1 NO	9	NO
15	(+)	10	RTN
16	B1 NC		
17	B2 NO	11	NO
18	(+)	12	RTN
19	B2 NC		
20	B3 NO	14	NO
21	(+)	15	RTN
22	B3 NC		
23	B4 NO	17	NO
24	(+)	18	RTN
25	B4 NC		
26			
27			
28	C1 NO	19	NO
29	C2 NO	21	NO
30	C3 NO	23	NO
31	C4 NO	25	NO
32	(+)	20,22,	RTN
33	(+)	24,26	RTN
34	NC		
35	D1 NO	27	NO
36	D2 NO	29	NO
37	D3 NO	32	NO
38	D4 NO	35	NO
39	(+)	28,30	RTN
40	(+)	33,36	RTN

3.22 IC695CRH023 – 90-70 ALG230 to RX3i ALG616 Harness Assembly

3.22.1 Analog Input Modules

8 Channel Base Converter

IC697ALG230



This module has eight differential inputs and an expansion port. Each input can be individually configured for either voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 volts and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.

16/8 Channel Voltage/Current

IC695ALG616

Non-Isolated Differential Analog Voltage/Current Input module IC695ALG616, provides 16 single- ended or 8 differential input channels.

Analog input channels can be configured for these ranges:

•Current: 0 to 20mA, 4 to 20mA, ±20mA

•Voltage: ±10V, 0 to 10V, ±5V, 0 to 5V, 1 to 5V

This module must be located in an RX3i Universal Backplane. It requires an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.22.2 Specification Comparison

Specification	IC697ALG230	IC694ALG616	Notes
Input Range Current Voltage	 4 to 20mA ±10V, 0 to 10V, ±5V, 0 to 5V	 0 to 20mA, 4 to 20mA, ±20mA ±10V, 0 to 10V, ±5V, 0 to 5V, 1 to 5V	
Calibration	Factory set at full scale = 10 volts ±2 millivolts	12 months typical to meet accuracy specifications over time. Offset can be applied as a periodic calibration adjustment.	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage No missing codes over 14 bits on current	24 bit ADC converted to Floating Point or Integer	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0 to 10V, 0 to 5V, 1 to 5V: 0.2% 0 to 20 mA: 0.25% 4 to 20 mA: 0.3125% ±5V, ±10V: 0.1% ±20 mA: 0.125% @ 0°C – 60°C with 8 Hz, 12 Hz and 16 Hz filter	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Voltage Inputs: Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 >100 Kohm voltage inputs 249 ohms ±1%	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption	0.8A (4 watts) maximum @ 5.0V	450 mA maximum @ 5.0V +5% / -2.5%, 600 mA maximum @ 3.3V +5% / -3%	

3.22.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697ALG230		IC695ALG616	
Terminals		Terminals (TB1)	
1	I1 (CJ)		
2	I2 (CJ)		
3	I1 (+)	1	I1 (+)
4	I2 (+)	3	I2 (+)
5	I1 (-)	2	I1 (-)
6	I2 (-)	4	I2 (-)
7	I1 GND	5	GND
8	I2 GND	5	GND
9	I3 (CJ)		
10	I4 (CJ)		
11	I3 (+)	6	I3 (+)
12	I4 (+)	8	I4 (+)
13	I3 (-)	7	I3 (-)
14	I4 (-)	9	I4 (-)
15	I3 GND	5	GND
16	I4 GND	5	GND
17	I5 (CJ)		
18	I6 (CJ)		
19	I5 (+)	10	I5 (+)
20	I6 (+)	12	I6 (+)
21	I5 (-)	11	I5 (-)
22	I6 (-)	I3	I6 (-)
23	I5 GND	14	GND
24	I6 GND	14	GND
25	I7 (CJ)		
26	I8 (CJ)		
27	I7 (+)	15	I7 (+)
28	I8 (+)	17	I8 (+)
29	I7 (-)	16	I7 (-)
30	I8 (-)	18	I8 (-)
31	I7 GND	14	GND
32	I8 GND	14	GND
33	COM		
34	COM		
35	GND		
36	3E		
37	1E		
38	4E		
39	2E		
40	COM		

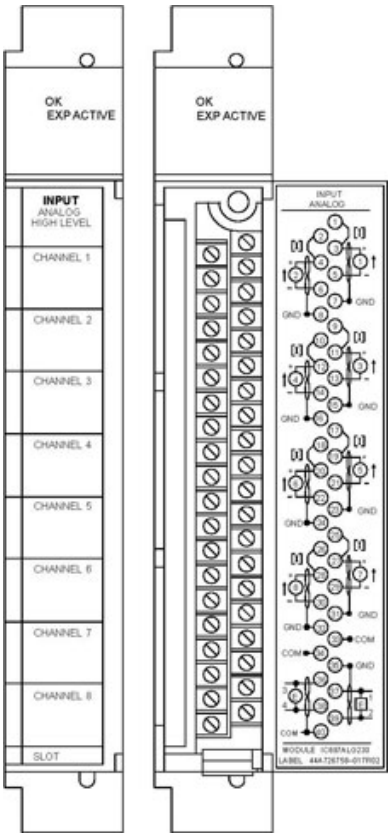
For Current Inputs	
Input	Jumper Terminals
1	2-19
2	4-21
3	7-24
4	9-26
5	11-28
6	13-30
7	16-33
8	18-35

3.23 IC695CRH024 – 90-70 ALG230 to RX3i ALG220 Harness Assembly

3.23.1 Analog Input Modules

8 Channel Base Converter

IC697ALG230



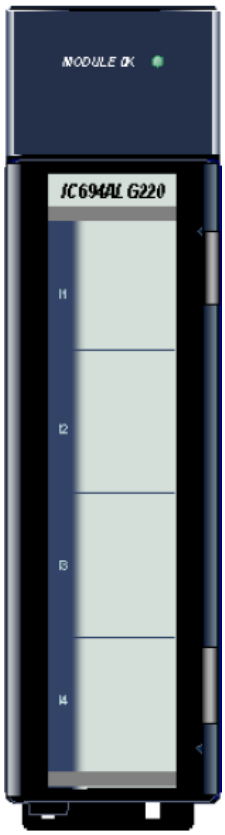
This module has eight differential inputs and an expansion port. Each input can be individually configured for either voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 volts and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.

4 Channel Differential,

IC694ALG220



The four-channel Analog Voltage Input module, IC694ALG220, provides four analog input channels. This module accepts inputs in the range of -10 to +10 volts. Individual channels can be used with 4 to 20 mA inputs by jumpering the input terminals.

Conversion speed for each of the four channels is one millisecond.

This provides an update rate of four milliseconds for any channel.

This module can be installed in any I/O slot of an RX3i PLC

3.23.2 Specification Comparison

Specification	IC697ALG230	IC694ALG220	Notes
Input Range Current Voltage	 4 to 20 mA ±10V, 0 to 10V, ±5V, 0 to 5V	 4 to 20 mA -10 to +10 volts	2 Module Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage No missing codes over 14 bits on current	5 mV/20 µA, (1 LSB = 5 mV)	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±10 mV/40 µA (typical) ±30 mV/160 µA (maximum)	**Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.**
Input Impedance Voltage Inputs: Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 > 9 Megohms 250 ohms	
Isolation Voltage terminal block to backplane/chassis	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	27 mA @ 5.0V	

3.23.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG230		IC694ALG220		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (CJ)				
2	I2 (CJ)				
3	I1 (+)	3	I1 (+)		
4	I2 (+)	4	I2 (+)		
5	I1 (-)	5	I1 (-)		
6	I2 (-)	6	I2 (-)		
7	I1 GND	9	I1 GND		
8	I2 GND	10	I2 GND		
9	I3 (CJ)				
10	I4 (CJ)				
11	I3 (+)	13	I3 (+)		
12	I4 (+)	14	I4 (+)		
13	I3 (-)	15	I3 (-)		
14	I4 (-)	16	I4 (-)		
15	I3 GND	19	I3 GND		
16	I4 GND	20	I4 GND		
17	I5 (CJ)				
18	I6 (CJ)				
19	I5 (+)			3	I1 (+)
20	I6 (+)			4	I2 (+)
21	I5 (-)			5	I1 (-)
22	I6 (-)			6	I2 (-)
23	I5 GND			9	I5 GND
24	I6 GND			10	I6 GND
25	I7 (CJ)				
26	I8 (CJ)				
27	I7 (+)			13	I3 (+)
28	I8 (+)			14	I4 (+)
29	I7 (-)			15	I3 (-)
30	I8 (-)			16	I4 (-)
31	I7 GND			19	I7 GND
32	I8 GND			20	I8 GND
33	COM				
34	COM				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

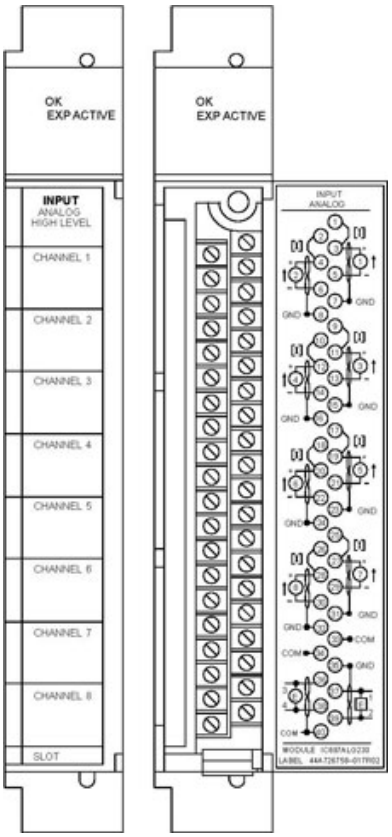
For Current Inputs		
Input	Jumper Terminals RX3i Module 1 (A)	Jumper Terminals RX3i Module 2 (B)
1	1-3	1-3
2	2-4	2-4
3	11-13	11-13
4	12-14	12-14

3.24 IC695CRH025 – 90-70 ALG230 to RX3i ALG221 Harness Assembly

3.24.1 Analog Input Modules

8 Channel Base Converter

IC697ALG230



This module has eight differential inputs and an expansion port. Each input can be individually configured for either voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 volts and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.

4 Channel Differential Current,

IC694ALG221

The 4–Channel Analog Current Input module, IC694ALG221, provides four analog input channels. This module has two possible input ranges:

- 4 to 20mA
- 0 to 20mA

Conversion speed for each of the four channels is one–half millisecond. This provides an update rate of two milliseconds for any channel. Resolution of the converted signal is 12 bits binary (1 part in 4096) over either range.

This module can be installed in any I/O slot of an RX3i system.

3.24.2 Specification Comparison

Specification	IC697ALG230	IC694ALG221	Notes
Input Range Current Voltage	 4 to 20 mA ±10V, 0 to 10V, ±5V, 0 to 5V	4 to 20 mA and 0 to 20 mA	2 Module Replacement Current Only
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated to 4 µA per count	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage No missing codes over 14 bits on current	4 µA (1 LSB = 4 µA) @ 4 - 20mA 5 µA (1 LSB = 5 µA) @ 0 - 20mA	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0.1% full scale + 0.1% reading	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Voltage Inputs: Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 250 ohms	
Isolation Voltage terminal block to backplane/chassis	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	25 mA maximum @ 5.0V	

3.24.3 Pin Mapping

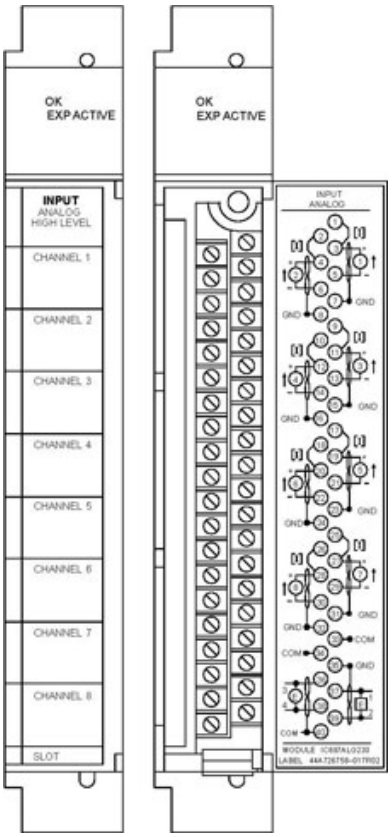
IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG230		IC694ALG221		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (CJ)				
2	I2 (CJ)				
3	I1 (+)	3	I1 (+)		
4	I2 (+)	4	I2 (+)		
5	I1 (-)	5	I1 (-)		
6	I2 (-)	6	I2 (-)		
7	I1 GND	9	I1 GND		
8	I2 GND	10	I2 GND		
9	I3 (CJ)				
10	I4 (CJ)				
11	I3 (+)	13	I3 (+)		
12	I4 (+)	14	I4 (+)		
13	I3 (-)	15	I3 (-)		
14	I4 (-)	16	I4 (-)		
15	I3 GND	19	I3 GND		
16	I4 GND	20	I4 GND		
17	I5 (CJ)				
18	I6 (CJ)				
19	I5 (+)			3	I1 (+)
20	I6 (+)			4	I2 (+)
21	I5 (-)			5	I1 (-)
22	I6 (-)			6	I2 (-)
23	I5 GND			9	I5 GND
24	I6 GND			10	I6 GND
25	I7 (CJ)				
26	I8 (CJ)				
27	I7 (+)			13	I3 (+)
28	I8 (+)			14	I4 (+)
29	I7 (-)			15	I3 (-)
30	I8 (-)			16	I4 (-)
31	I7 GND			19	I7 GND
32	I8 GND			20	I8 GND
33	COM				
34	COM				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.25 IC695CRH026 – 90-70 ALG230 to RX3i ALG222 Harness Assembly

3.25.1 Analog Input Modules

8 Channel Base Converter

IC697ALG230



This module has eight differential inputs and an expansion port. Each input can be individually configured for either voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to 40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for 10 volts and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.

16/8 Channel Voltage,

IC694ALG222

The 16–Channel Analog Voltage Input module, IC694ALG222, provides 16 single-ended or eight differential input channels.

Each channel can be configured using the configuration software for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot of anRX3i system.

3.25.2 Specification Comparison

Specification	IC697ALG230	IC694ALG222	Notes
Input Range Current Voltage	 4 to 20 mA ±10V, 0 to 10V, ±5V, 0 to 5V	 -10 V to +10 V	Voltage Only
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated to 5 mV per count on -10 to +10 V	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage No missing codes over 14 bits on current	5 mV (1 LSB = 5 mV)	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	+/10.25% of full scale @ 25°C	
Input Impedance Voltage Inputs: Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 >1 MegaOhms	
Isolation Voltage terminal block to backplane/chassis	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	112 mA maximum @ 5.0V	

3.25.3 Pin Mapping

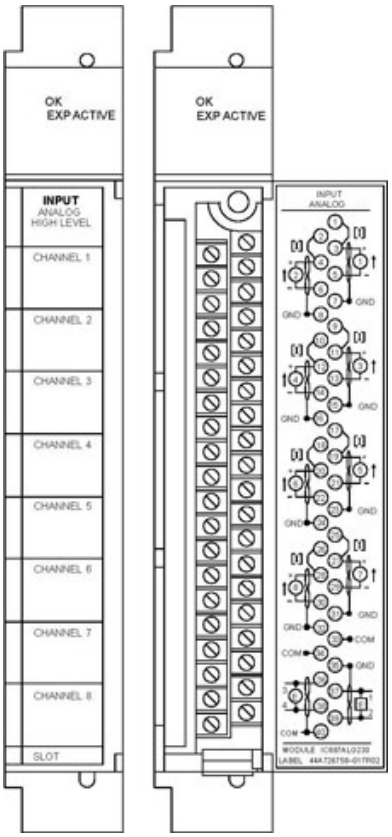
IC695ACC651		RX3i Module1	
IC697ALG230		IC694ALG222	
Terminals		Terminals (TB1)	
1	I1 (CJ)		
2	I2 (CJ)		
3	I1 (+)	3	I1 (+)
4	I2 (+)	6	I2 (+)
5	I1 (-)	4	I1 (-)
6	I2 (-)	5	I2 (-)
7	I1 GND	20	GND
8	I2 GND	20	GND
9	I3 (CJ)		
10	I4 (CJ)		
11	I3 (+)	7	I3 (+)
12	I4 (+)	10	I4 (+)
13	I3 (-)	8	I3 (-)
14	I4 (-)	9	I4 (-)
15	I3 GND	20	GND
16	I4 GND	20	GND
17	I5 (CJ)		
18	I6 (CJ)		
19	I5 (+)	11	I5 (+)
20	I6 (+)	14	I6 (+)
21	I5 (-)	12	I5 (-)
22	I6 (-)	13	I6(-)
23	I5 GND	20	GND
24	I6 GND	20	GND
25	I7 (CJ)		
26	I8 (CJ)		
27	I7 (+)	15	I7 (+)
28	I8 (+)	18	I8 (+)
29	I7 (-)	16	I7 (-)
30	I8 (-)	17	I8 (-)
31	I7 GND	20	GND
32	I8 GND	20	GND
33	COM		
34	COM		
35	GND		
36	3E		
37	1E		
38	4E		
39	2E		
40	COM		

3.26 IC695CRH027 – 90-70 ALG230 to RX3i ALG232 Harness Assembly

3.26.1 Analog Input Modules

8 Channel Base Converter

IC697ALG230



This module has eight differential inputs and an expansion port. Each input can be individually configured for either voltage or current. Each of the input channels also has individual user scaling.

On-board load resistors are included for normal input current ranges up to ±40 mA. If other current ranges or different resolution is required, external resistors may be used.

Standard system configurations for ±10 volts and 4 to 20 mA are available. These, and other lower input ranges, can be scaled to engineering units with the user scaling feature.

16/8 Channel Voltage,

IC694ALG232

The PACSystems RX3i 16-Channel Analog Voltage Input module provides 16 single-ended or 8 differential input channels. Each channel can be configured for either of two input ranges:

- ▪ 0 to 10 V (unipolar), default
- ▪ -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot that has a serial connector in anRX3i system.

3.26.2 Specification Comparison

Specification	IC697ALG230	IC694ALG232	Notes
Input Range Current Voltage	 4 to 20 mA ±10V, 0 to 10V, ±5V, 0 to 5V	 0 V to +10 V (unipolar) or -10 V to +10 V (bipolar) selectable each channel	Customer Validation required: IC694ALG232 is Voltage Only module.
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated to: 0.3125 mV per count on 0 V to +10 V (unipolar) range 0.3125 mV per count on -10 to +10 V (bipolar) range	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage No missing codes over 14 bits on current	1 LSB = 0.3125 mV	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±0.25% of full scale @ 25°C (77°F) ±0.5% of full scale over specified operating temperature range	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Voltage Inputs: Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 >500K Ohms (single-ended mode) >1 MegaOhms (differential mode)	
Isolation Voltage terminal block to backplane/chassis	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	112 mA maximum @ 5.0V	

3.26.3 Pin Mapping

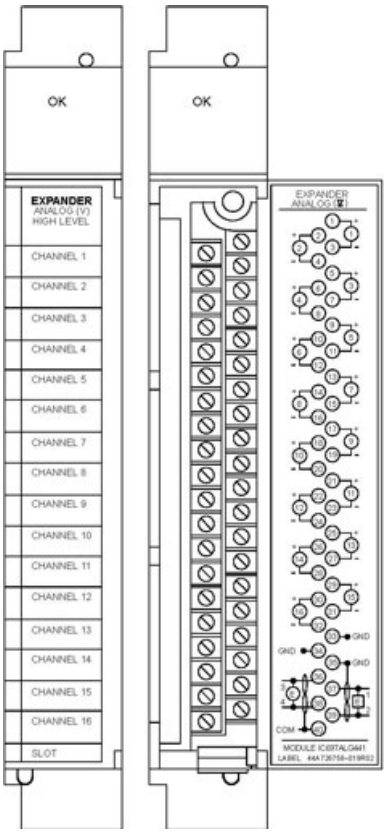
IC695ACC651		RX3i Module1	
IC697ALG230		IC694ALG232	
Terminals		Terminals (TB1)	
1	I1 (CJ)		
2	I2 (CJ)		
3	I1 (+)	3	I1 (+)
4	I2 (+)	6	I2 (+)
5	I1 (-)	4	I1 (-)
6	I2 (-)	5	I2 (-)
7	I1 GND	20	GND
8	I2 GND	20	GND
9	I3 (CJ)		
10	I4 (CJ)		
11	I3 (+)	7	I3 (+)
12	I4 (+)	10	I4 (+)
13	I3 (-)	8	I3 (-)
14	I4 (-)	9	I4 (-)
15	I3 GND	20	GND
16	I4 GND	20	GND
17	I5 (CJ)		
18	I6 (CJ)		
19	I5 (+)	11	I5 (+)
20	I6 (+)	14	I6 (+)
21	I5 (-)	12	I5 (-)
22	I6 (-)	13	I6(-)
23	I5 GND	20	GND
24	I6 GND	20	GND
25	I7 (CJ)		
26	I8 (CJ)		
27	I7 (+)	15	I7 (+)
28	I8 (+)	18	I8 (+)
29	I7 (-)	16	I7 (-)
30	I8 (-)	17	I8 (-)
31	I7 GND	20	GND
32	I8 GND	20	GND
33	COM		
34	COM		
35	GND		
36	3E		
37	1E		
38	4E		
39	2E		
40	COM		

3.27 IC695CRH028 – 90-70 ALG440 to RX3i ALG616 Harness Assembly

3.27.1 Analog Input Modules

16 Channel Current Expander

IC697ALG440



The Current Expander module has 16 current inputs each accepting up to ±20 mA.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

16/8 Channel Voltage/Current

IC695ALG616

Non-Isolated Differential Analog Voltage/Current Input module IC695ALG616, provides 16 single-ended or 8 differential input channels.

Analog input channels can be configured for these ranges:

- Current: 0 to 20mA, 4 to 20mA, ± 20mA
- Voltage: ±10V, 0 to 10V, ± 5V, 0 to 5V, 1 to 5V

This module must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.27.2 Specification Comparison

Specification	IC697ALG440	IC695ALG616	Notes
Input Range Current Voltage	4 to 20mA	0 to 20mA, 4 to 20mA, ±20mA ±10V, 0 to 10V, ±5V, 0 to 5V, 1 to 5V	Two-card replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	12 months typical to meet accurate specifications over time. Offset can be applied as a periodic calibration adjustment.	
Resolution	Default Scaling (16 bit) 0.5 microamps per LSB step on 4 to 20 mA. No missing codes over 14 bits on current	24 bit ADC converted to Floating Point or Integer	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0 to 20 mA: 0.25% 4 to 20 mA: 0.3125% ±20 mA: 0.125%	
Input Impedance Current Inputs:	250 ohm, 0.1% precision shunt	249 ohms ±1%	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	450 mA maximum @ 5.0V +5% / -2.5% 600 mA maximum @ 3.3V +5% / -3%	

3.27.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG440		IC695ALG616		IC695ALG616	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	1	I1 (+)		
2	I2 (+)	3	I2 (+)		
3	I1 (-)	2	I1 (-)		
4	I2 (-)	4	I2 (-)		
5	I3 (+)	6	I3 (+)		
6	I4 (+)	8	I4 (+)		
7	I3 (-)	7	I3 (-)		
8	I4 (-)	9	I4 (-)		
9	I5 (+)	10	I5 (+)		
10	I6 (+)	12	I6 (+)		
11	I5 (-)	11	I5 (-)		
12	I6 (-)	13	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	17	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	18	I8 (-)		
17	I9 (+)			1	I1 (+)
18	I10 (+)			3	I2 (+)
19	I9 (-)			2	I1 (-)
20	I10 (-)			4	I2 (-)
21	I11 (+)			6	I3 (+)
22	I12 (+)			8	I4 (+)
23	I11 (-)			7	I3 (-)
24	I12 (-)			9	I4 (-)
25	I13 (+)			10	I5 (+)
26	I14 (+)			12	I6 (+)
27	I13 (-)			11	I5 (-)
28	I14 (-)			13	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			17	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			18	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

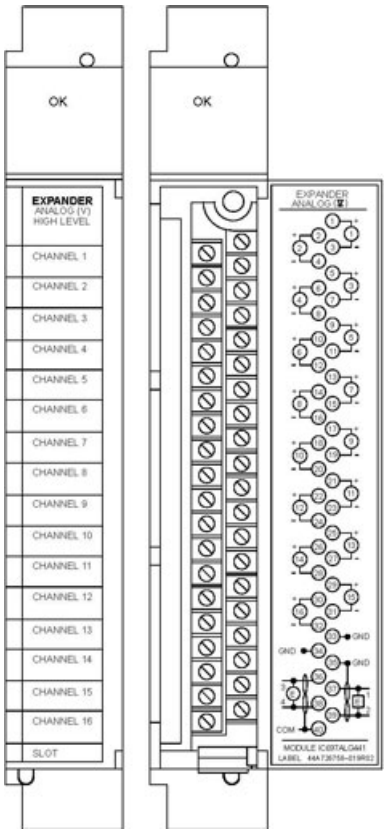
For Current Inputs		
Input	Jumper Terminals Rx3i Module1	Jumper Terminals Rx3i Module2
1	2 - 19	2 - 19
2	4 - 21	4 - 21
3	7 - 24	7 - 24
4	9 - 26	9 - 26
5	11 - 28	11 - 28
6	13 - 30	13 - 30
7	16 - 33	16 - 33
8	18 - 35	18 - 35

3.28 IC695CRH029 – 90-70 ALG440 to RX3i ALG220 Harness Assembly

3.28.1 Analog Input Modules

16 Channel Current Expander

IC697ALG440



The Current Expander module has 16 current inputs each accepting up to ±20 mA.

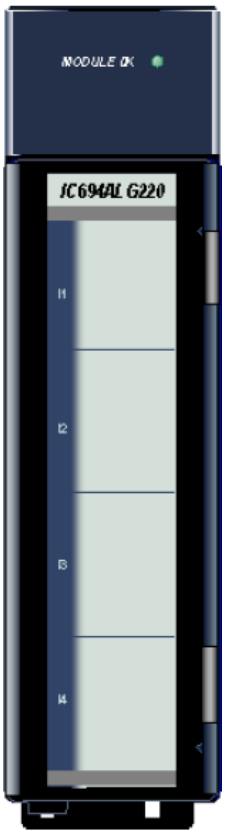
Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

4 Channel Differential

IC694ALG220



The 4–Channel Analog Voltage Input module, IC694ALG220, provides four analog input channels. This module accepts inputs in the range of -10 to +10 volts. Individual channels can be used with 4 to 20 mA inputs by jumpering the input terminals.

Conversion speed for each of the four channels is one millisecond.

This provides an update rate of four milliseconds for any channel.

This module can be installed in any I/O slot of an RX3i PLC.

3.28.2 Specification Comparison

Specification	IC697ALG440	IC694ALG220	Notes
Input Range Current Voltage	4 to 20mA	4 to 20 mA -10 to +10 volts	4 Card Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated	
Resolution	Default Scaling (16 bit) 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 14 bits on current	5 mV/20 µA, (1 LSB = 5 mV)	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±10 mV/40 µA (typical) ±30 mV/160 µA (maximum)	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs: :	250 ohm, 0.1% precision shunt	> 9 Megohms 250 ohms	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	27 mA @ 5.0V	

3.28.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3		RX3i Module4	
IC697ALG440		IC694ALG220		IC694ALG220		IC694ALG220		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)		Terminals (TB4)	
1	I1 (+)	3	I1 (+)						
2	I2 (+)	4	I2 (+)						
3	I1 (-)	5	I1 (-)						
4	I2 (-)	6	I2 (-)						
5	I3 (+)	13	I3 (+)						
6	I4 (+)	14	I4 (+)						
7	I3 (-)	15	I3 (-)						
8	I4 (-)	16	I4 (-)						
9	I5 (+)			3	I1 (+)				
10	I6 (+)			4	I2 (+)				
11	I5 (-)			5	I1 (-)				
12	I6 (-)			6	I2 (-)				
13	I7 (+)			13	I3 (+)				
14	I8 (+)			14	I4 (+)				
15	I7 (-)			15	I3 (-)				
16	I8 (-)			16	I4 (-)				
17	I9 (+)					3	I1 (+)		
18	I10 (+)					4	I2 (+)		
19	I9 (-)					5	I1 (-)		
20	I10 (-)					6	I2 (-)		
21	I11 (+)					13	I3 (+)		
22	I12 (+)					14	I4 (+)		
23	I11 (-)					15	I3 (-)		
24	I12 (-)					16	I4 (-)		
25	I13 (+)							3	I1 (+)
26	I14 (+)							4	I2 (+)
27	I13 (-)							5	I1 (-)
28	I14 (-)							6	I2 (-)
29	I15 (+)							13	I3 (+)
30	I16 (+)							14	I4 (+)
31	I15 (-)							15	I3 (-)
32	I16 (-)							16	I4 (-)
33	GND								
34	GND								
35	GND								
36	3E								
37	1E								
38	4E								
39	2E								
40	COM								

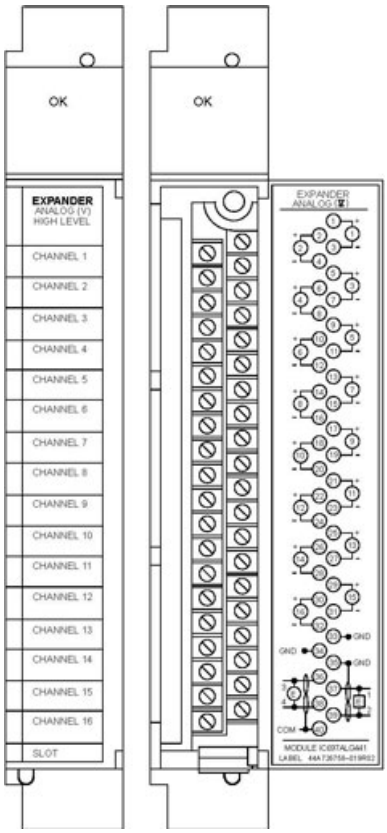
For Current Inputs	
Input	Jumper
RX3i Module 1 (A)	
1	1-3
2	2-4
3	11-13
4	12-14
RX3i Module 2 (B)	
1	1-3
2	2-4
3	11-13
4	12-14
RX3i Module3 (C)	
1	1-3
2	2-4
3	11-13
4	12-14
RX3i Module4 (D)	
1	1-3
2	2-4
3	11-13
4	12-14

3.29 IC695CRH030 – 90-70 ALG440 to RX3i ALG221 Harness Assembly

3.29.1 Analog Input Modules

16 Channel Current Expander

IC697ALG440



The Current Expander module has 16 current inputs each accepting up to ±20 mA.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module; however each Expander module may be individually scaled as required.

4 Channel Differential Current

IC694ALG221

The 4–Channel Analog Current Input module, IC694ALG221, provides four analog input channels. This module has two possible input ranges:

- •4 to 20 mA
- •0 to 20 mA

Conversion speed for each of the four channels is one–half millisecond. This provides an update rate of two milliseconds for any channel. Resolution of the converted signal is 12 bits binary (1 part in 4096) over either range.

This module can be installed in any I/O slot of an RX3i system.

3.29.2 Specification Comparison

Specification	IC697ALG440	IC694ALG221	Notes
Input Range Current Voltage	 4 to 20mA –10 volts to +10 volts	4 to 20 mA and 0 to 20 mA	4 Card Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated to 4 µA per count	
Resolution	Default Scaling (16 bit) 0.5 µA per LSB step on 4 to 20 mA No missing codes over 14 bits on current	4 µA (1 LSB = 4 µA) @ 4 - 20mA 5 µA (1 LSB = 5 µA) @ 0 - 20mA	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0.1% full scale + 0.1% reading	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs:	 250 ohm, 0.1% precision shunt	 250 ohms	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	25 mA maximum @ 5.0V	

3.29.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3		RX3i Module4	
IC697ALG440		IC694ALG221		IC694ALG221		IC694ALG221		IC694ALG221	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)		Terminals (TB4)	
1	I1 (+)	3	I1 (+)						
2	I2 (+)	4	I2 (+)						
3	I1 (-)	5	I1 (-)						
4	I2 (-)	6	I2 (-)						
5	I3 (+)	13	I3 (+)						
6	I4 (+)	14	I4 (+)						
7	I3 (-)	15	I3 (-)						
8	I4 (-)	16	I4 (-)						
9	I5 (+)			3	I1 (+)				
10	I6 (+)			4	I2 (+)				
11	I5 (-)			5	I1 (-)				
12	I6 (-)			6	I2 (-)				
13	I7 (+)			13	I3 (+)				
14	I8 (+)			14	I4 (+)				
15	I7 (-)			15	I3 (-)				
16	I8 (-)			16	I4 (-)				
17	I9 (+)					3	I1 (+)		
18	I10 (+)					4	I2 (+)		
19	I9 (-)					5	I1 (-)		
20	I10 (-)					6	I2 (-)		
21	I11 (+)					13	I3 (+)		
22	I12 (+)					14	I4 (+)		
23	I11 (-)					15	I3 (-)		
24	I12 (-)					16	I4 (-)		
25	I13 (+)							3	I1 (+)
26	I14 (+)							4	I2 (+)
27	I13 (-)							5	I1 (-)
28	I14 (-)							6	I2 (-)
29	I15 (+)							13	I3 (+)
30	I16 (+)							14	I4 (+)
31	I15 (-)							15	I3 (-)
32	I16 (-)							16	I4 (-)
33	GND								
34	GND								
35	GND								
36	3E								
37	1E								
38	4E								
39	2E								
40	COM								

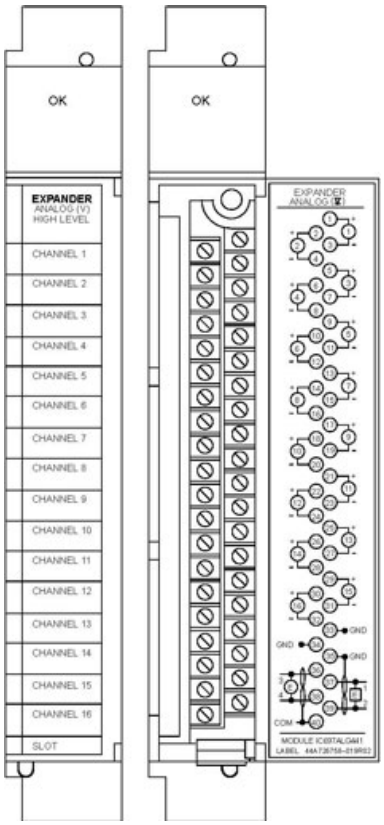
For 0-20mA	
Input	**Jumper**
RX3i Module 1 (A)	
1, 2	1-2
3, 4	11-12
RX3i Module 2 (B)	
1, 2	1-2
3, 4	11-12
RX3i Module3 (TB3)	
1, 2	1-2
3, 4	11-12
RX3i Module4 (TB4)	
1, 2	1-2
3, 4	11-12

3.30 IC695CRH031 – 90-70 ALG441 to RX3i ALG616 Harness Assembly

3.30.1 Analog Input Modules

16 Channel Voltage Expander

IC697ALG441



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

16/8 Channel Voltage/Current

IC695ALG616

Non-Isolated Differential Analog Voltage/Current Input module IC695ALG616, provides 16 single-ended or 8 differential input channels.

Analog input channels can be configured for these ranges:

- Current: 0 to 20mA, 4 to 20mA, ±20mA
- Voltage: ±10V, 0 to 10V, ±V, 0 to 5V, 1 to 5V

This module must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.30.2 Specification Comparison

Specification	IC697ALG441	IC695ALG616	Notes
Input Range Current Voltage	 ±10V, 0 to 10V, ±5V, 0 to 5V	0 to 20mA, 4 to 20mA, ±20mA ±10V, 0 to 10V, ±5V, 0 to 5V, 1 to 5V	2 Card Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	12 months typical to meet accuracy specifications over time. Offset can be applied as a periodic calibration adjustment.	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage No missing codes over 16 bits on voltage	24 bit ADC converted to Floating Point or Integer	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	0 to 20 mA: 0.25% 4 to 20 mA: 0.3125% ±20 mA: 0.125%	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	249 ohms ±1%	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	450 mA maximum @ 5.0V +5% / -2.5%, 600 mA maximum @ 3.3V +5% / -3%	

3.30.3 Pin Mapping

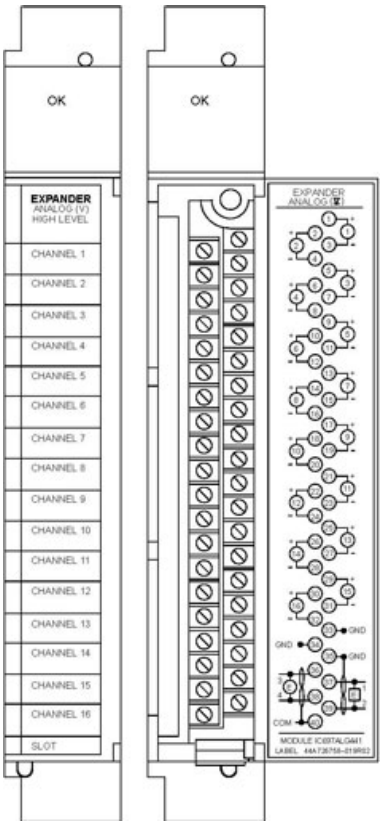
IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG441		IC695ALG616		IC695ALG616	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	1	I1 (+)		
2	I2 (+)	3	I2 (+)		
3	I1 (-)	2	I1 (-)		
4	I2 (-)	4	I2 (-)		
5	I3 (+)	6	I3 (+)		
6	I4 (+)	8	I4 (+)		
7	I3 (-)	7	I3 (-)		
8	I4 (-)	9	I4 (-)		
9	I5 (+)	10	I5 (+)		
10	I6 (+)	12	I6 (+)		
11	I5 (-)	11	I5 (-)		
12	I6 (-)	13	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	17	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	18	I8 (-)		
17	I9 (+)			1	I1 (+)
18	I10 (+)			3	I2 (+)
19	I9 (-)			2	I1 (-)
20	I10 (-)			4	I2 (-)
21	I11 (+)			6	I3 (+)
22	I12 (+)			8	I4 (+)
23	I11 (-)			7	I3 (-)
24	I12 (-)			9	I4 (-)
25	I13 (+)			10	I5 (+)
26	I14 (+)			12	I6 (+)
27	I13 (-)			11	I5 (-)
28	I14 (-)			13	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			17	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			18	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.31 IC695CRH032 – 90-70 ALG441 to RX3i ALG220 Harness Assembly

3.31.1 Analog Input Modules

16 Channel Voltage Expander

IC697ALG441



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

4 Channel Differential

IC694ALG220

The 4–Channel Analog Voltage Input module, IC694ALG220, provides four analog input channels. This module accepts inputs in the range of -10 to +10 volts. Individual channels can be used with 4 to 20 mA inputs by jumpering the input terminals.

Conversion speed for each of the four channels is one millisecond.

This provides an update rate of four milliseconds for any channel.

This module can be installed in any I/O slot of an RX3i PLC.

3.31.2 Specification Comparison

Specification	IC697ALG441	IC694ALG220	Notes
Input Range Current Voltage	 ±10V, 0 to 10V, ±5V, 0 to 5V	 4 to 20 mA -10 to +10 volts	4 Card Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage No missing codes over 16 bits on voltage	5 mV/20 µA, (1 LSB = 5 mV)	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±10 mV/40 µA (typical) ±30 mV/160 µA (maximum)	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 > 9 Megohms 250 ohms	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	27 mA @ 5.0V	

3.31.3 Pin Mapping

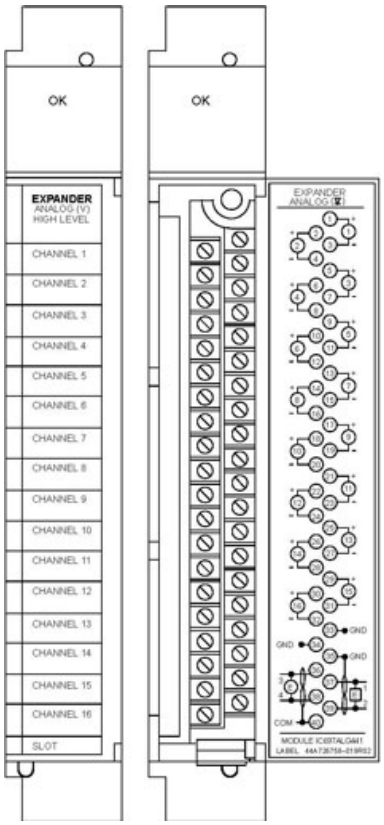
IC695ACC651		RX3i Module1		RX3i Module2		RX3i Module3		RX3i Module4	
IC697ALG441		IC694ALG220		IC694ALG220		IC694ALG220		IC694ALG220	
Terminals		Terminals (TB1)		Terminals (TB2)		Terminals (TB3)		Terminals (TB4)	
1	I1 (+)	3	I1 (+)						
2	I2 (+)	4	I2 (+)						
3	I1 (-)	5	I1 (-)						
4	I2 (-)	6	I2 (-)						
5	I3 (+)	13	I3 (+)						
6	I4 (+)	14	I4 (+)						
7	I3 (-)	15	I3 (-)						
8	I4 (-)	16	I4 (-)						
9	I5 (+)			3	I1 (+)				
10	I6 (+)			4	I2 (+)				
11	I5 (-)			5	I1 (-)				
12	I6 (-)			6	I2 (-)				
13	I7 (+)			13	I3 (+)				
14	I8 (+)			14	I4 (+)				
15	I7 (-)			15	I3 (-)				
16	I8 (-)			16	I4 (-)				
17	I9 (+)					3	I1 (+)		
18	I10 (+)					4	I2 (+)		
19	I9 (-)					5	I1 (-)		
20	I10 (-)					6	I2 (-)		
21	I11 (+)					13	I3 (+)		
22	I12 (+)					14	I4 (+)		
23	I11 (-)					15	I3 (-)		
24	I12 (-)					16	I4 (-)		
25	I13 (+)							3	I1 (+)
26	I14 (+)							4	I2 (+)
27	I13 (-)							5	I1 (-)
28	I14 (-)							6	I2 (-)
29	I15 (+)							13	I3 (+)
30	I16 (+)							14	I4 (+)
31	I15 (-)							15	I3 (-)
32	I16 (-)							16	I4 (-)
33	GND								
34	GND								
35	GND								
36	3E								
37	1E								
38	4E								
39	2E								
40	COM								

3.32 IC695CRH033 – 90-70 ALG441 to RX3i ALG222 Harness Assembly

3.32.1 Analog Input Modules

16 Channel Voltage Expander

IC697ALG441



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

6/8 Channel Voltage

IC694ALG222

The 16–Channel Analog Voltage Input module, IC694ALG222, provides 16 single-ended or eight differential input channels.

Each channel can be configured using the configuration software for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot of an RX3i system.

3.32.2 Specification Comparison

Specification	IC697ALG441	IC694ALG222	Notes
Input Range Current Voltage	 4, 20 mA ±10V, 0 to 10V, ±5V, 0 to 5V	 -10 V to +10 V	2 Card Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated to 5 mV per count on -10 to +10 V	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage No missing codes over 16 bits on voltage	5 mV (1 LSB = 5 mV)	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±10.25% of full scale @ 25°C	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 >1 MegaOhms	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	112 mA maximum @ 5.0V	

3.32.3 Pin Mapping

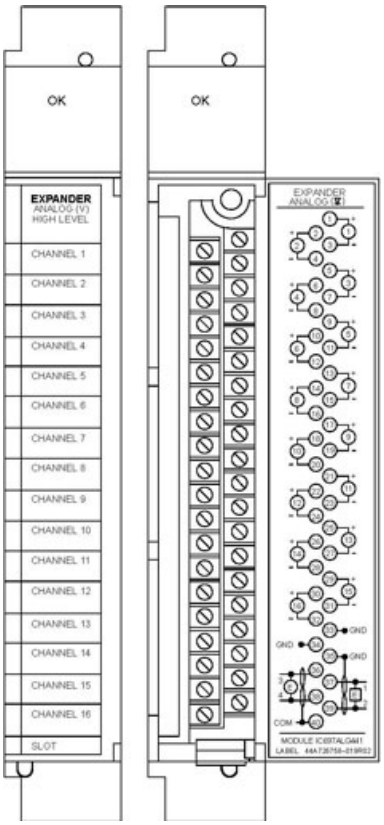
IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG441		IC694ALG222		IC694ALG222	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	3	I1 (+)		
2	I2 (+)	6	I2 (+)		
3	I1 (-)	4	I1 (-)		
4	I2 (-)	5	I2 (-)		
5	I3 (+)	7	I3 (+)		
6	I4 (+)	10	I4 (+)		
7	I3 (-)	8	I3 (-)		
8	I4 (-)	9	I4 (-)		
9	I5 (+)	11	I5 (+)		
10	I6 (+)	14	I6 (+)		
11	I5 (-)	12	I5 (-)		
12	I6 (-)	13	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	18	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	17	I8 (-)		
17	I9 (+)			3	I1 (+)
18	I10 (+)			6	I2 (+)
19	I9 (-)			4	I1 (-)
20	I10 (-)			5	I2 (-)
21	I11 (+)			7	I3 (+)
22	I12 (+)			10	I4 (+)
23	I11 (-)			8	I3 (-)
24	I12 (-)			9	I4 (-)
25	I13 (+)			11	I5 (+)
26	I14 (+)			14	I6 (+)
27	I13 (-)			12	I5 (-)
28	I14 (-)			13	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			18	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			17	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.33 IC695CRH034 – 90-70 ALG441 to RX3i ALG232 Harness Assembly

3.33.1 Analog Input Modules

16 Channel Voltage Expander

IC697ALG441



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required

16/8 Channel Voltage

IC694ALG232

The PAC Systems RX3i 16-Channel Analog Voltage Input module provides 16 single-ended or 8 differential input channels. Each channel can be configured for either of two input ranges:

- 0 to 10 V (unipolar), default
- -10 to +10 V (bipolar)

High and Low alarm limits can be configured for both ranges.

This module can be installed in any I/O slot that has a serial connector in an RX3i system.

3.33.2 Specification Comparison

Specification	IC697ALG441	IC694ALG232	Notes
Input Range Current Voltage	 4, 20 mA ±10V, 0 to 10V, ±5V, 0 to 5V	 0 V to +10 V (unipolar) or -10 V to +10 V (bipolar) selectable each channel	2 Card Replacement
Calibration	Factory set at full scale = 10 volts ±2 millivolts	Factory calibrated to: 0.3125 mV per count on 0 V to +10 V (unipolar) range 0.3125 mV per count on -10 to +10 V (bipolar) range	
Resolution	Default Scaling (16 bit) 312.5 microvolts per LSB step on voltage No missing codes over 16 bits on voltage	1 LSB = 0.3125 mV	
Absolute Accuracy	±.02% of full scale over entire negative to positive range	±0.25% of full scale @ 25°C (77°F) ±0.5% of full scale over specified operat- ing temperature range	Customer Validation required on existing applications to determine if accuracy of RX3i analog module is adequate.
Input Impedance Current Inputs:	 Greater than 10 megohms at DC AC impedance, 20K ohms in series with .47 mfd capacitor. 250 ohm, 0.1% precision shunt	 >500K Ohms (single-ended mode) >1 MegaOhms (differential mode)	
Isolation	120 VAC or 125 VDC for 1 minute	250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	0.8A (4 watts) maximum @ 5.0V	112 mA maximum @ 5.0V	

3.33.3 Pin Mapping

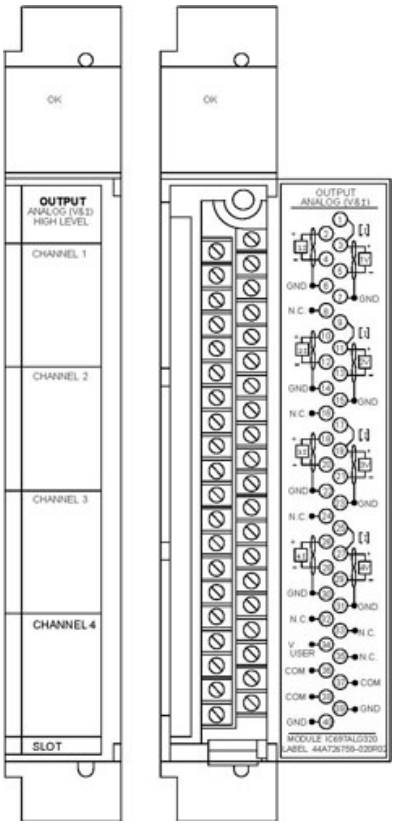
IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG441		IC694ALG232		IC694ALG232	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 (+)	3	I1 (+)		
2	I2 (+)	6	I2 (+)		
3	I1 (-)	4	I1 (-)		
4	I2 (-)	5	I2 (-)		
5	I3 (+)	7	I3 (+)		
6	I4 (+)	10	I4 (+)		
7	I3 (-)	8	I3 (-)		
8	I4 (-)	9	I4 (-)		
9	I5 (+)	11	I5 (+)		
10	I6 (+)	14	I6 (+)		
11	I5 (-)	12	I5 (-)		
12	I6 (-)	13	I6 (-)		
13	I7 (+)	15	I7 (+)		
14	I8 (+)	18	I8 (+)		
15	I7 (-)	16	I7 (-)		
16	I8 (-)	17	I8 (-)		
17	I9 (+)			3	I1 (+)
18	I10 (+)			6	I2 (+)
19	I9 (-)			4	I1 (-)
20	I10 (-)			5	I2 (-)
21	I11 (+)			7	I3 (+)
22	I12 (+)			10	I4 (+)
23	I11 (-)			8	I3 (-)
24	I12 (-)			9	I4 (-)
25	I13 (+)			11	I5 (+)
26	I14 (+)			14	I6 (+)
27	I13 (-)			12	I5 (-)
28	I14 (-)			13	I6 (-)
29	I15 (+)			15	I7 (+)
30	I16 (+)			18	I8 (+)
31	I15 (-)			16	I7 (-)
32	I16 (-)			17	I8 (-)
33	GND				
34	GND				
35	GND				
36	3E				
37	1E				
38	4E				
39	2E				
40	COM				

3.34 IC695CRH035 – 90-70 ALG320 to RX3i ALG708 Harness Assembly

3.34.1 Analog Output Modules

4 Channel Voltage / Current

IC697ALG320



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

4/8 Channel Voltage / Current

IC695ALG704/708

Non-Isolated Analog Voltage/Current Output module IC695ALG704 provides 4 configurable voltage or current output channels. Analog channels can be configured for these output ranges:

- Current: 0 to 20mA, 4 to 20mA
- Voltage: ±10V, 0 to 10V

This module must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.34.2 Specification Comparison

Specification	IC697ALG320	IC695ALG708	Notes
Output Ranges:	Current: 0 to 22.5 mA, 4 to 20 mA Voltage: ±10 V, 0 to 10 V	Current: 0 to 20 mA, 4 to 20 mA Voltage: ±10 V, 0 to 10 V	
Calibration	Voltage: Factory set at full scale = 10 volts ±2.5 millivolts. Current: Factory set at 4.0 mA ±5 mA and 20 mA ±5 mA. Full Scale, with 24.0 VDC field side voltage.	Accurate to within 0.15% of full scale at 25°C Accurate to within 0.30% of full scale at 60°C	
Resolution	16 bit with 14 bit monotonicity 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage. No missing codes over 15 bits on current.	±10 V: 15.9 bits, 0 to 10 V: 14.9 bits, 0 to 20 mA: 15.9 bits, 4 to 20 mA : 15.6 bits	
Response times Voltage: Current :	 5.0% 0.5 milliseconds 0.1% 2.0 milliseconds 5.0% 1.0 milliseconds 0.1% 5.0 milliseconds	8 milliseconds	RX3i is four times slower for voltage output.
Isolation		2550 VDC for one second	
Power Consumption:	1.66 A (8.3 watts) maximum @ 5.0V	375 mA maximum at 3.3V	

3.34.3 Pin Mapping

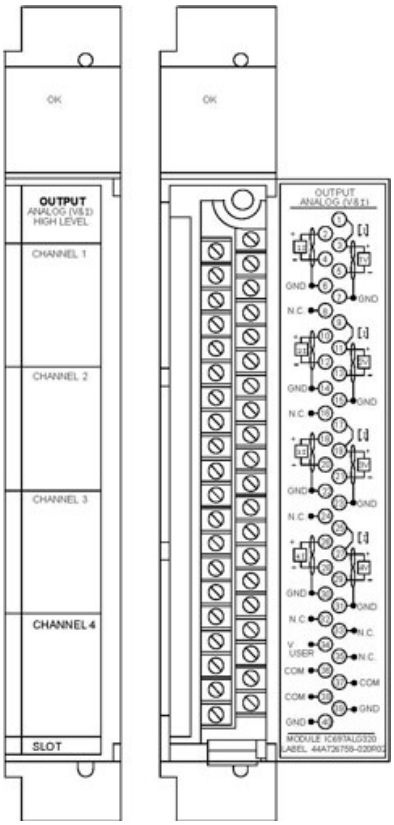
IC695ACC651		RX3i Module1	
IC697ALG320		IC695ALG708	
Terminals		Terminals (TB1)	
1	I1 REF		
2	I1 (+)	20	I1 (+)
3	V1 (+)	19	V1 (+)
4	I1 (-)	21	1 COM
5	V1 (-)	21	1 COM
6	I GND		
7	V GND		
8	NC		
9	I2 REF		
10	I2 (+)	2	I2 (+)
11	V2 (+)	1	V2 (+)
12	I2 (-)	3	2 COM
13	V2 (-)	3	2 COM
14	I GND		
15	V GND		
16	NC		
17	I3 REF		
18	I3 (+)	23	I3 (+)
19	V3 (+)	22	V3 (+)
20	I3 (-)	24	3 COM
21	V3 (-)	24	3 COM
22	I GND		
23	V GND		
24	NC		
25	I4 REF		
26	I4 (+)	5	I4 (+)
27	V4 (+)	4	V4 (+)
28	I4 (-)	6	4 COM
29	V4 (-)	6	4 COM
30	I GND		
31	V GND		
32	NC		
33	NC		
34	PWR +	36	+24V
35	NC		
36	PWR -	18	-24V
37	PWR -		
38	PWR -		
39	GND		
40	GND		

3.35 IC695CRH036 – 90-70 ALG320 to RX3i ALG390 Harness Assembly

3.35.1 Analog Output Modules

4 Channel Voltage / Current

IC697ALG320



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

2 Channel Voltage

IC694ALG390

The 2–Channel Analog Voltage Output module, IC694ALG390, has two output channels, each capable of converting 13 bits of binary (digital) data to an analog output signal for field devices. The module provides outputs in the range of -10 volts to +10 volts.

The module's outputs can be set up to either Default to 0 volts or Hold–Last–State if the CPU goes to the Stop mode or Reset. Selection of the output default state is made by a jumper on the module. If the jumper is not installed, the outputs Hold Last State.

This module can be installed in any I/O slot in anRX3i system.

3.35.2 Specification Comparison

Specification	IC697ALG320	IC694ALG390	Notes
Output Ranges:	Current: 0 to 22.5 mA, 4 to 20 mA Voltage: ±10 V, 0 to 10 V	-10 to +10 volts	2 Card Replacement Voltage Only
Calibration	Voltage: Factory set at full scale = 10 volts ±2.5 millivolts. Current: Factory set at 4.0 mA ±5 mA and 20 mA ±5 mA. Full Scale, with 24.0 VDC field side voltage.	Factory calibrated to 2.5 mV per count	
Resolution	16 bit with 14 bit monotonicity 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage. No missing codes over 15 bits on current.	2.5 mV (1 LSB = 2.5 mV)	
Response times Voltage: Current :	 5.0% 0.5 milliseconds 0.1% 2.0 milliseconds 5.0% 1.0 milliseconds 0.1% 5.0 milliseconds	5 milliseconds	Customer validation required to verify that the response time is adequate.
Isolation		250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	1.66 A (8.3 watts) maximum @ 5.0 V	32 mA from +5 VDC supply	

3.35.3 Pin Mapping

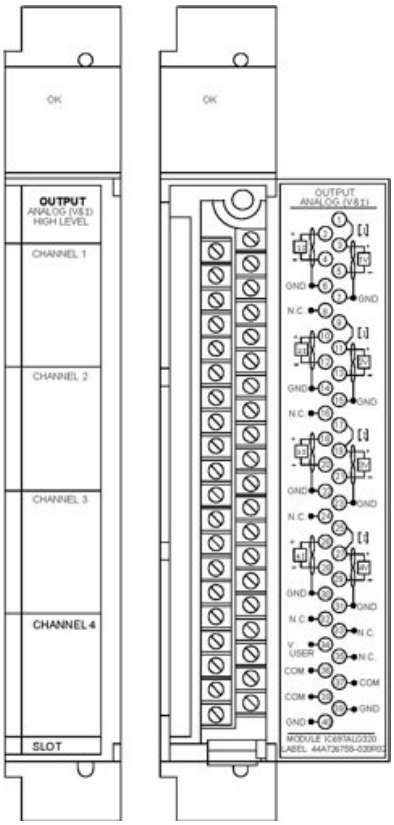
IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG320		IC694ALG390		IC694ALG390	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 REF				
2	I1 (+)				
3	V1 (+)	3	V1 (+)		
4	I1 (-)				
5	V1 (-)	5	1 COM		
6	I GND				
7	V GND				
8	NC				
9	I2 REF				
10	I2 (+)				
11	V2 (+)	4	V2 (+)		
12	I2 (-)				
13	V2 (-)	6	2 COM		
14	I GND				
15	V GND				
16	NC				
17	I3 REF				
18	I3 (+)				
19	V3 (+)			3	V1 (+)
20	I3 (-)				
21	V3 (-)			5	1 COM
22	I GND				
23	V GND				
24	NC				
25	I4 REF				
26	I4 (+)				
27	V4 (+)			4	V2 (+)
28	I4 (-)				
29	V4 (-)			6	2 COM
30	I GND				
31	V GND				
32	NC				
33	NC				
34	PWR +	17 / 17	+24V		
35	NC				
36	PWR -	19	-24V		
37	PWR -			19	-24V
38	PWR -				
39	GND				
40	GND				

3.36 IC695CRH037 – 90-70 ALG320 to RX3i ALG391 Harness Assembly

3.36.1 Analog Output Modules

4 Channel Voltage / Current

IC697ALG320



The Voltage Expander module has 16 differential voltage inputs each accepting up to ±10V signals.

Up to seven Expander modules can be daisy chained off the Base Converter module to increase the number of inputs of the total subsystem up to a maximum of 120.

The Base Converter module accepts any mix of the two Expander module types.

A common user scaling factor applies to all inputs on each Expander module, however each Expander module may be individually scaled as required.

2 Channel Current

IC694ALG391

The 2-Channel Analog Current Output module, IC694ALG391, has two output channels, each capable of converting 12 bits of binary (digital) data to an analog output signal for field devices. Each output can be set using a jumper on the module to produce output signals in one of two ranges:

- 0 to 20 mA
- 4 to 20 mA.

Each output may also be set up as a less accurate voltage source. The selection of current or voltage output is made with a jumper or resistor on the module terminals. Both channels are updated on every scan. This module can be installed in any I/O slot in an RX3i system.

3.36.2 Specification Comparison

Specification	IC697ALG320	IC694ALG391	Notes
Output Ranges:	Current: 0 to 22.5 mA, 4 to 20 mA Voltage: ±10 V, 0 to 10 V	Current: 0 to 20 mA, 4 to 20 mA Voltage: 0 to 5 V, 1 to 5 V	2 Card Replacement RX3i 5 Volt Limit
Calibration	Voltage: Factory set at full scale = 10 volts ±2.5 millivolts. Current: Factory set at 4.0 mA ±5 mA and 20 mA ±5 mA. Full Scale, with 24.0 VDC field side voltage.	Factory calibrated to 4 µA per count	
Resolution	16 bit with 14 bit monotonicity 312.5 microvolts per LSB step on voltage 0.5 microamps per LSB step on 4 to 20 mA No missing codes over 16 bits on voltage. No missing codes over 15 bits on current.	4 µA (1 LSB = 4 µA) @ 4 to 20mA 5 µA (1 LSB = 5 µA) @ 0 to 20mA 1 mV (1 LSB = 1 mV) @ 1 to 5 V 1.25 mV (1 LSB = 1.25 mV) @ 0 to 5 V	
Response times Voltage: Current :	 5.0% 0.5 milliseconds 0.1% 2.0 milliseconds 5.0% 1.0 milliseconds 0.1% 5.0 milliseconds	5 milliseconds	Customer validation required to verify that the response time is adequate.
Isolation		250 VAC continuous 1500 VAC for 1 minute	
Power Consumption:	1.66 A (8.3 watts) maximum @ 5.0 V	30 mA from +5 VDC supply	

3.36.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697ALG320		IC694ALG391		IC694ALG391	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	I1 REF				
2	I1 (+)	3	I1 (+)		
3	V1 (+)	1	V1 (+)		
4	I1 (-)	5	RTN1		
5	V1 (-)	5	RTN1		
6	I GND	7	1 GND		
7	V GND	7	1 GND		
8	NC				
9	I2 REF				
10	I2 (+)	4	I2 (+)		
11	V2 (+)	2	V2 (+)		
12	I2 (-)	6	RTN2		
13	V2 (-)	6	RTN2		
14	I GND	8	2 GND		
15	V GND	8	2 GND		
16	NC				
17	I3 REF				
18	I3 (+)			3	I1 (+)
19	V3 (+)			1	V1 (+)
20	I3 (-)			5	RTN1
21	V3 (-)			5	RTN1
22	I GND			7	1 GND
23	V GND			7	1 GND
24	NC				
25	I4 REF				
26	I4 (+)			4	I2 (+)
27	V4 (+)			2	V2 (+)
28	I4 (-)			6	RTN2
29	V4 (-)			6	RTN2
30	I GND			8	2 GND
31	V GND			8	2 GND
32	NC				
33	NC				
34	PWR +	17 / 17	+24V		
35	NC				
36	PWR -	19	-24V		
37	PWR -			19	-24V
38	PWR -				
39	GND				
40	GND				

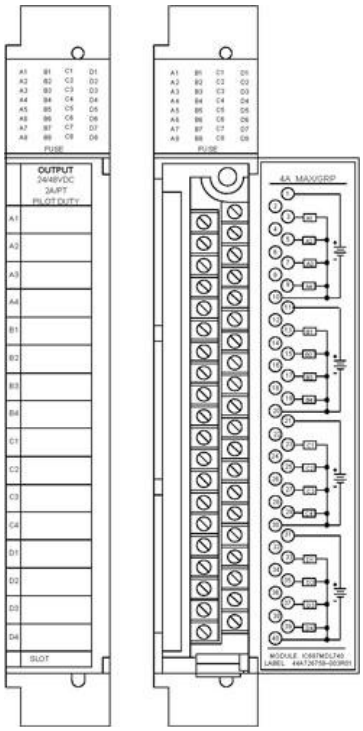
For 0-20mA	
Input	Jumper
RX3i Module 1 (A)	
1	3-9
2	4-10
RX3i Module 2 (B)	
1	3-9
2	4-10

3.37 IC695CRH038 – 90-70 MDL740 to RX3i MDL765 Harness Assembly

3.37.1 Discrete Output Modules

24/48 Volt DC, 2 Amp, 16 Point

IC697MDL740



The 24/48 Volt DC 2 Amp Output Module provides 16 output points in four isolated groups of 4 points each.

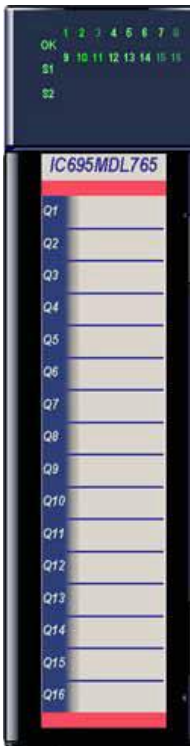
Each group of four outputs is individually fused with a 10 amp fuse.

The module provides a high degree of inrush current which makes the outputs suitable for a wide range of loads which have such characteristics.

LED indicators which give the ON-OFF status of each point on the logic (PLC) side of the circuit as well as an LED to indicate the status of the fuse are located together at the top of the module.

24/125 VDC, 2A, 16 Pt,

IC695MDL765



The 24/125 volt DC 2A Smart Digital Output module, IC695MDL765, provides 16 discrete outputs in two isolated groups of 8 outputs. Each group of 8 outputs is referenced to an isolated common, providing group-to-group isolation. The module uses 24 VDC or 125 VDC.

These modules must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.37.2 Specification Comparison

Specification	IC697MDL740	IC695MDL765	Notes
Rated Voltage:	24 or 48 volts DC	18 to 30VDC 105 to 132VDC	**Customer validation required:** IC695MDL765 does not support voltages above 30V.
Output Voltage Range:	20 to 60 volts		
Outputs per Module:	16 (four groups of 4 outputs each)	16 (two isolated groups of 8 outputs each)	
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC 1500 VAC	
Output Current:	2 amps maximum per point 4 amps maximum per group		
Output Characteristics			
Inrush Current Output Voltage Drop: Response Time ON Response Time OFF Output leakage	20 amps maximum for 20 ms 0.8 volt (0.4 ohm) maximum 2 ms maximum 2 ms maximum 1 mA maximum	10A supplied for 10ms without ESCP trip 1ms maximum 1ms maximum 1mA maximum	
Power Consumption:	.15 amp @ 5V	125mA @ 3.3V 540mA @ 5.1V	
VME	System designed to support the VME standard C.1		

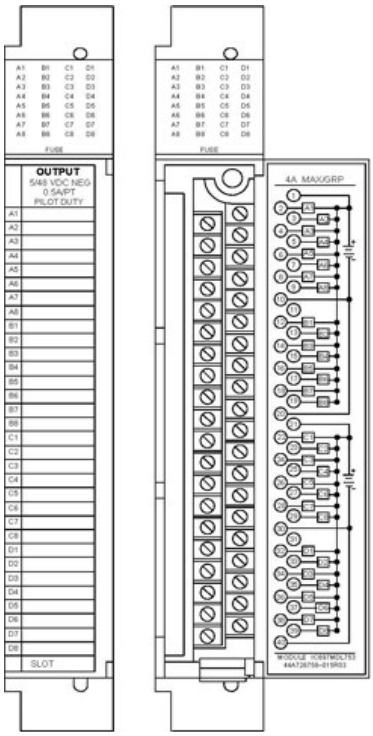
3.37.3 Pin Mapping

IC695ACC651		RX3i Module1	
IC697MDL740		IC695MDL765	
Terminals		Terminals (TB1)	
1	(+)	17	DC+
2	NC		
3	A1	1	Output 1
4	NC		
5	A2	3	Output 2
6	NC		
7	A3	5	Output 3
8	NC		
9	A4	7	Output 4
10	(-)	18	DC-
11	(+)	35	DC+
12	NC		
13	B1	9	Output 5
14	NC		
15	B2	11	Output 6
16	NC		
17	B3	13	Output 7
18	NC		
19	B4	15	Output 8
20	(-)	36	DC-
21	(+)	17	DC+
22	NC		
23	C1	19	Output 9
24	NC		
25	C2	21	Output 10
26	NC		
27	C3	23	Output 11
28	NC		
29	C4	25	Output 12
30	(-)	18	DC-
31	(+)	35	DC+
32	NC		
33	D1	27	Output 13
34	NC		
35	D2	29	Output 14
36	NC		
37	D3	31	Output 15
38	NC		
39	D4	33	Output 16
40	(-)	36	DC-

3.38 IC695CRH039 – 90-70 MDL753 to RX3i MDL765 Harness Assembly

3.38.1 Discrete Output Modules

5/48 Volt DC, 0.5 Amp, Neg 32 Point, IC697MDL753

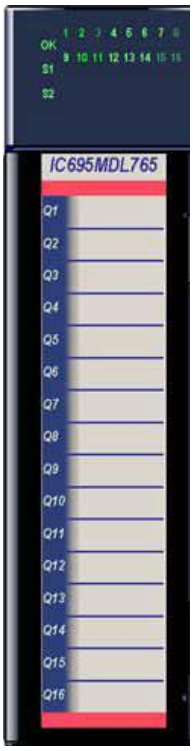


The 5/48 Volt DC 0.5 Amp Negative Logic Output Module provides 32 output points in two isolated groups with 16 points in each group.

This is a wide range module in that the rated voltage can be 5 volts DC or 10 to 60 volts DC. It provides a high degree of inrush current at 10 volts to 60 volts which makes the outputs suitable for a wide range of loads which have such characteristics. It also operates at TTL levels.

LED indicators which give the ON - OFF status of each point on the logic (PLC) side of the circuit are located at the top of the module.

24/125 VDC, 2A, 16 Pt, IC695MDL765



The 24/125 volt DC 2A Smart Digital Output module, IC695MDL765, provides 16 discrete outputs in two isolated groups of 8 outputs. Each group of 8 outputs is referenced to an isolated common, providing group-to-group isolation. The module uses 24 VDC or 125 VDC.

These modules must be located in an RX3i Universal Backplane. They require an RX3i CPU with firmware version 3.0 or later. Machine Edition Version 5.0 SP3 Logic Developer-PLC or later must be used for configuration.

3.38.2 Specification Comparison

Specification	IC697MDL753	IC695MDL765	Notes
Rated Voltage:	5 volts DC (“ 5%) 10 to 60 volts DC	18 to 30VDC 105 to 132VDC	**Customer validation required:** IC695MDL765 can support applications from 18 to 30VDC only.
Output Voltage Range:	5 volts or 10 to 60 volts		
Outputs per Module:	32 (two groups of 16 outputs each)	16 (two isolated groups of 8 outputs each)	2 Module Replacement
Isolation:	1500 volts - any input to backplane 500 volts between input groups	250 VAC 1500 VAC	
Output Current: 5 volts DC 10 to 60 volts DC	 16 mA maximum per point 0.5 amps maximum per point 4 amps maximum per group		
Output Characteristics			
Inrush Current: 10 to 60 volts DC Output Voltage Drop: 5 volts DC 10 to 60 volts DC On response Time Off response Time Output Leakage: 5 volts DC 10 to 60 volts DC	 5 amps maximum for 20 ms 0.5 volts maximum (16 mA) 1 volt (2 ohms) maximum 1 ms typical 1 ms typical 250 mA maximum 1 mA maximum	 10A supplied for 10ms without ESCP trip 1ms maximum 1ms maximum 1mA maximum	
Power Consumption:	.25 amp @ 5V	125mA @ 3.3V 540mA @ 5.1V	
VME	System designed to support the VME standard C.1		

3.38.3 Pin Mapping

IC695ACC651		RX3i Module1		RX3i Module2	
IC697MDL753		IC695MDL765		IC695MDL765	
Terminals		Terminals (TB1)		Terminals (TB2)	
1	(+)	17/35	DC+		
2	A1	1	Output 1		
3	A2	3	Output 2		
4	A3	5	Output 3		
5	A4	7	Output 4		
6	A5	9	Output 5		
7	A6	11	Output 6		
8	A7	13	Output 7		
9	A8	15	Output 8		
10	(-)	18	DC-		
11	NC				
12	B1	19	Output 9		
13	B2	21	Output 10		
14	B3	23	Output 11		
15	B4	25	Output 12		
16	B5	27	Output 13		
17	B6	29	Output 14		
18	B7	31	Output 15		
19	B8	33	Output 16		
20	(-)	36	DC-		
21	(+)			17/35	DC+
22	C1			1	Output 1
23	C2			3	Output 2
24	C3			5	Output 3
25	C4			7	Output 4
26	C5			9	Output 5
27	C6			11	Output 6
28	C7			13	Output 7
29	C8			15	Output 8
30	(-)			18	DC-
31	NC				
32	D1			19	Output 9
33	D2			21	Output 10
34	D3			23	Output 11
35	D4			25	Output 12
36	D5			27	Output 13
37	D6			29	Output 14
38	D7			31	Output 15
39	D8			33	Output 16
40	(-)			36	DC-

4. Agency Approvals and Government Regulations

4.1 Agency Approvals

Description	Agency Standard or Marking	Comments
N.A. Safety for Industrial Control Equipment for use in Hazardous Areas Class 1 Div. 2 Groups ABCD	UL508 17th Ed. CSA C22.2 No 142-M1987 ANSI/ISA 12.12.01 CSA C22.2 No 213-M1987	Certification by Underwriter's Laboratories as a "Listed Accessory". This product will be referenced as an accessory on the RX3i product listing card file E157515.
Low Voltage Directive European Safety for Industrial Control Equipment	CE	Self-Declaration in accordance with European LVD Directive 2006/95/EC; Independent 3rd party assessment
Electromagnetic Compatibility Directive European EMC for Industrial Control Equipment	CE	Self-Declaration in accordance with European EMC Directive 2004/108/EC; Independent 3rd party assessment
Explosive Atmospheres Directive European Safety for Hazardous Locations Equipment Group II, Category 3, Gas Group IIC	Ex	Self-Declaration in accordance with ATEX Directive 94/9/EC; Independent 3rd party assessment

Note: A product's approval should be verified by the marking on the unit or by the Agency listing card.

4.2 Agency Warnings and Installation Guidelines

General Safety

- For use in Pollution Degree 2 Environment providing protection from mechanical damage.

UL Class 1 Division 2 Hazardous Areas Requirements

- SUITABLE FOR USE IN CLASS I, DIVISION 2, GROUPS A, B, C AND D HAZARDOUS LOCATIONS, OR NONHAZARDOUS LOCATIONS ONLY.
- WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOW TO BE FREE OF IGNITABLE CONCENTRATIONS.
- WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.

ATEX Class 1 Zone 2 Hazardous Areas Requirements

In order to maintain compliance with the ATEX Directive, an RX3i system located in a Class 1 Zone 2 area (Category 3) must be installed within a protective enclosure meeting the criteria detailed below:

- IP54 or greater, and
- Mechanical strength to withstand an impact energy of 3.5 Joules

Agency approvals, 126
Features, 9
Government regulations, 126
Installation and setup, 10
Modules, supported, 13
Part numbers
IC695ACC650 – 90-70 to RX3i Conversion Rack, 9
IC695ACC651 – 90-70 to RX3i I/O Adapter Card, 9
IC695CRH001 – 90-70 MDL252 to RX3i MDL241 Harness Assembly, 14
IC695CRH002 – 90-70 MDL253 to RX3i MDL241 Harness Assembly, 18
IC695CRH003 – 90-70 MDL250 to RX3i MDL260 Harness Assembly, 21
IC695CRH004 – 90-70 MDL240 to RX3i MDL250 Harness Assembly, 24
IC695CRH005 – 90-70 MDL251 to RX3i MDL240 Harness Assembly, 27
IC695CRH006 – 90-70 MDL251 to RX3i MDL250 Harness Assembly, 30
IC695CRH007 – 90-70 MDL241 to RX3i MDL231 Harness Assembly, 33
IC695CRH008 – 90-70 MDL653 to RX3i MDL660 Harness Assembly, 36
IC695CRH009 – 90-70 MDL652 to RX3i MDL654 Harness Assembly, 39
IC695CRH010 – 90-70 MDL654 to RX3i MDL658 Harness Assembly, 42
IC695CRH011 – 90-70 MDL640 to RX3i MDL632 Harness Assembly, 45
IC695CRH013 – 90-70 MDL671 to RX3i MDL645 Harness Assembly, 48
IC695CRH014 – 90-70 MDL350 to RX3i MDL340 Harness Assembly, 51
IC695CRH015 – 90-70 MDL340 to RX3i MDL330 Harness Assembly, 54
IC695CRH018 – 90-70 MDL341 to RX3i MDL390 Harness Assembly, 63
IC695CRH022 – 90-70 MDL940 to RX3i MDL916 Harness Assembly, 72
IC695CRH023 – 90-70 ALG230 to RX3i ALG616 Harness Assembly, 75
IC695CRH025 – 90-70 ALG230 to RX3i ALG221 Harness Assembly, 81
IC695CRH026 – 90-70 ALG230 to RX3i ALG222 Harness Assembly, 84
IC695CRH027 – 90-70 ALG230 to RX3i ALG232 Harness Assembly, 87
IC695CRH028 – 90-70 ALG440 to RX3i ALG616 Harness Assembly, 90
IC695CRH029 – 90-70 ALG440 to RX3i ALG220 Harness Assembly, 93
IC695CRH030 – 90-70 ALG440 to RX3i ALG221 Harness Assembly, 96
IC695CRH031 – 90-70 ALG441 to RX3i ALG616 Harness Assembly, 99
IC695CRH032 – 90-70 ALG441 to RX3i ALG220 Harness Assembly, 102
IC695CRH033 – 90-70 ALG441 to RX3i ALG222 Harness Assembly, 105
IC695CRH034 – 90-70 ALG441 to RX3i ALG232 Harness Assembly, 108
IC695CRH035 – 90-70 ALG320 to RX3i ALG708 Harness Assembly, 111
IC695CRH036 – 90-70 ALG320 to RX3i ALG390 Harness Assembly, 114
IC695CRH037 – 90-70 ALG320 to RX3i ALG391 Harness Assembly, 117
IC695CRH038 – 9070 MDL740 to RX3i MDL765 Harness Assembly, 120
IC695CRH039 – 9070 MDL753 to RX3i MDL765 Harness Assembly, 123
Replacements for 90-70 I/O, 13
Technical Support, 3
Wiring procedures, 11

GE Intelligent Platforms Information Centers

Headquarters:
1-800-433-2682 or 1-434-978-5100

Global regional phone numbers are available on our web site www.ge-ip.com

Additional Resources

For more information, please visit the GE Intelligent Platforms web site:

www.ge-ip.com

©2012 GE Intelligent Platforms, Inc. All Rights Reserved

***Trademark of GE Intelligent Platforms, Inc.**

All other brands or names are property of their respective holders.

GFK-2793A